Strait of Georgia Pollock Survey During 1980 Roe Fishery: *M/V Sun Maiden*

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STRAIT OF GEORGIA POLLOCK SURVEY DURING 1980

ROE FISHERY: M/V SUN MAIDEN

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ABSTRACT

Robinson, C. K., J. M. Thompson, and L. W. Barner. 1982. Strait of Georgia pollock survey during 1980 roe fishery: M/V SUN MAIDEN. Can. Data Rep. Fish. Aquat. Sci. 346: iv + 59 p.

Midwater sounder targets and midwater trawl indicated two areas of high density -- one near Halibut Bank and the other off Sand Heads. Pollock ranged in fork length from 28 to 63 cm and had a modal length of 41 cm. Females comprised 90% of the catches at depths less than 130 m and 23% of the catches at depths greater than 130 m. Catches east of Mayne Island had the highest percentage of immature pollock (3.3%) and the highest percentage of females in the ripe stage of maturity (63%). The catches north of Mayne Island at depths greater than 130 m had the highest percentage of fish in later stages of maturity (1R, 2R, and RR -- 70%). Ages of pollock caught on the research cruise north of Mayne Island at depths greater than 130 m ranged from 2 to 8 years with a modal age of 3 years for both sexes. Ages of pollock from commercial catches during March in the same region and depth ranged from 3 to 8 years for the males and 3 to 9 years for the females, both sexes with a modal age of 5 years.

Length, sex, maturity, stomach contents, and distribution data were collected from catches of Pacific hake, dogfish, brown cat shark, and chinook salmon.

Key words: Walleye pollock, Georgia Strait, midwater trawl.

RÉSUMÉ

Robinson, C. K., J. M. Thompson, and L. W. Barner. 1982. Strait of Georgia pollock survey during 1980 roe fishery: M/V SUN MAIDEN. Can. Data Rep. Fish. Aquat. Sci. 346: iv + 59 p.

Les sondages et levés mésopélagiques révèlent la présence de deux zones de haute densité, l'une près du banc Halibut et l'autre au large de Sand Heads. La longueur à la fourche de la morue du Pacifique occidental varie de 28 à 63 cm, avec une longueur modale de 41 cm. Les femelles constituent 90% des prises capturées à une profondeur inférieure à 130 m et 23% des prises capturées à de plus grandes profondeurs. Les plus hauts pourcentages de morues immatures et de femelles pleines, soit 3,3% et 63% respectivement, se rencontrent dans les prises provenant de l'est de l'île Mayne. Les captures faites au nord de l'île Mayne à des profondeurs supérieures à 130 m comprennent le plus fort pourcentage de poissons à des stades de maturité plus avancés (1R, 2R, et RR: 70%). Les morues capturées au cours de l'expédition de recherche au nord de l'île Mayne à des profondeurs supérieures à 130 m sont âgées de 2 à 8 ans, avec un âge modal de 3 ans chez les deux sexes. L'âge des morues dans les prises commerciales capturées en mars dans cette même région et à une profondeur semblable varie de 3 à 8 ans chez les mâles et de 3 à 9 ans chez les femelles. L'âge modal chez les deux sexes est 5 ans.

On a aussi prélevé des données sur la longueur, le sexe, la maturité, les contenus stomacaux et la répartition du merlu du Pacifique, de l'aiguillat commun, de la roussette et du saumon quinnat.

Mots-clés: morue du Pacifique occidental, détroit de Géorgie, chalut mésopélagique.

INTRODUCTION

This cruise was undertaken to study walleye pollock distribution in the Strait of Georgia during the 1980 roe fishery season. The fishery developed in the Strait in 1978. Of the 320 t landed that year, 48% were taken in the open Strait of Georgia, north of a line drawn between Galiano Island and Fraser River. Catches rose to 966 t in 1979. This cruise was undertaken to investigate reports of low catch rates for this area in 1980 and to support ongoing studies examining the composition and distribution of midwater fishes, particularly walleye pollock and Pacific hake in the open Strait of Georgia. This report also presents results of ageing samples from the commercial roe fishery.

MATERIALS AND METHODS

The M/V SUN MAIDEN is a 24 m trawler powered by a 565 HP engine. The midwater trawl, designed and built by the vessel owners, was a box trawl with a 40 m (22 fm) footrope and 13.7-14.6 m (7.5-8.0 fm) mouth opening. A 3.8 cm (1.5 in) codend liner was used. Net depth was measured with a Furuno wet paper net sounder.

Sounding to produce a rough map of fish distribution, using a Kelvin Hughes drypaper sounder, was conducted by steaming during daylight at 7-9 knots along tracklines laid out to provide maximum coverage between hauls within the 5 day study period (Fig. 1). Densities were estimated by subjectively classifying the paper into 4 levels (nil, low, medium, and high).

Sets were made throughout the study area (Fig. 2, Appendix Table 1) to identify midwater echoes and obtain samples. Most sets were made in areas where fish density, estimated by studying images produced by the vessel's sounder, appeared to be the highest. Catches were weighed to the nearest kg by sorting fish into 55 L galvanized tubs. Fork lengths of pollock, hake, and salmon and total lengths of dogfish and brown cat shark were measured to the nearest whole centimetre. Pollock maturity stages were assigned according to those used for Pacific hake (Weir et al. 1978). Left pectoral fins were collected for age determination from fin ray sections (Beamish 1981). Two readers read every fin and differences were resolved by one reader rereading the fin. Some fins were interpreted as ranges of ages (eg. >3, 5-7). Individual weights were measured to $\pm$ 10 g on an electronic balance which automatically averaged 4 weighings to compensate for vessel motion.

Random 100-fish samples of pollock from catches by the commercial roe fishery were taken either at sea by an observer or at landing. Pollock were shovelled into tubs before the catch was sorted for size.

Fertilized pollock and hake ova were collected for a larval study being conducted by other investigations at the Pacific Biological Station. Frozen

pollock roe were collected for storage and quality studies being conducted by the Fisheries Research Laboratory at the University of British Columbia.

RESULTS AND DISCUSSION

GENERAL CRUISE SUMMARY

All fish and invertebrates caught during the cruise are listed by set in Table 1. Scientific and common names of species appear in Appendix Table 2.

Midwater sounder targets were common at bottom depths exceeding 130 m (71 fm) throughout the study area. There were two areas of high density -- one near Halibut Bank and the other off Sand Heads (Fig. 1). That the subjective criteria used indicated fish volume density can be seen by comparing it with the plot of combined pollock and hake catch rates (Fig. 2). The map also shows approximate fish abundance distribution, because echoes in high-density areas appeared across a range of vertical depth equal to or greater than in low-density areas.

Pollock and hake were present in all 22 catches. Pollock dominated hake in 14 sets and was most abundant (7945 kg), exceeding hake (3747 kg) and dogfish (1344 kg). Dogfish occurred in 21 catches. The lowest catch rates for pollock and hake were in sets made shallower than 130 m, north of Mayne Island (Table 4). In this area, midwater echoes were sparse and never dense above this depth.

WALLEYE POLLOCK

Length, sex, and maturity

A summary of biological samples collected is found in Table 2. Pollock caught north of Mayne Island at depths less than 130 m ranged from 36 to 49 cm in fork length and had a modal length of 45 cm (Tables 7, 8). Those caught at depths greater than 130 m in this area ranged from 28 to 60 cm in length with a modal length of 41 cm. Those caught east of Mayne Island ranged from 28 to 63 cm in length with a modal length of 39 cm. Females comprised 90% of the catches east of Mayne Island and 85% of the catches north of Mayne Island and shallower than 130 m. At depths greater than 130 m females comprised 23% of the catches. A total of 4683 pollock were sampled for maturity (Tables 5, 6). The region east of Mayne Island had the highest percentage of immature fish (3.3%; N=599) and the highest percentage of females in the ripe stage (63%). The catches north of Mayne Island at depths less than 130 m had the highest percentage of ripening (R1 and R2 -- 12%; N=67) and spent fish (7.5%). The catches north of Mayne Island at depths greater than 130 m had the highest percentage of fish in later stages of maturity (1R, 2R, and RR -- 70%; N=4017).

Age results

Females were larger in mean fork length at age for all ages greater than 3 years (Tables 9-12). Ages of pollock caught on the research cruise north of Mayne Island at depths greater than 130 m ranged from 2 to 8 years with a modal age of 3 years for both sexes (Fig. 3). Those caught commercially during March in the same region and depth ranged from 3 to 8 years for the males and 3 to 9 years for the females, both sexes with a modal age of 5 years. Those caught commercially in the same region during February and at depths less than 130 m ranged from 2 to 7 years for the males and 2 to 8 years for the females, both sexes with a modal age of 3 years. Pollock caught commercially east of Mayne Island during March ranged from 3 to 9 years for the males and 3 to 8 years for the females, both sexes with a modal age of 5 years.

Stomach contents

One hundred and fifty stomachs were sampled from sets 16 and 19 (net depth >130 m). Thirty-eight stomachs were empty (32%) and none were everted. Mean stomach content volume was 0.2 mL (n=112), empty stomachs not included. The contents included unidentifiable zooplankton, amphipods, glass shrimp, and fish eggs.

Weight-length relationship

Individual weights of adult pollock are presented by centimetre intervals and sex in Table 18.

PACIFIC HAKE

Table 3 contains a list of samples taken for species other than pollock. A total of 1391 Pacific hake were sampled. Males ranged in fork length from 18 to 52 cm with a modal length of 43 cm (Table 13). Females ranged from 18 to 73 cm with a modal length of 45 cm. Twelve hake, ranging from 9 to 14 cm in length, were of undetermined sex. Seventy-four percent of the hake were mature (N=1289) -- 78% of the males and 65% of the females (Table 14).

SPINY DOGFISH

Juvenile dogfish (<60 cm total length) were present in sets 1, 2, 3, and 6 from Ballenas Island to Halibut Bank (Table 15). Set 1, with an average net depth of 115 m, had the greatest number of juveniles (100%; N=207). Stomach contents included adult pollock, adult hake, fish fragments, and euphausiids. Seventy-eight percent of the fish from set 6 had empty stomachs (N=23; average net depth=141 m). Eighteen percent of the fish from set 11 (N=34; average net depth=182 m) and 21% of the fish from set 14 (N=19; average net depth=165 m) had empty

BROWN CAT SHARK

Brown cat shark ranged in total length from 44 to 57 cm (Table 16). Of 31 stomachs sampled, 1 contained shrimp and euphausiids, 1 contained a digested leuroglossus, and 1 contained a running grey liquid flecked with silver. Of 13 females sampled for maturity, 2 contained advanced egg cases.

CHINOOK SALMON

A total of 5 chinook salmon were caught during the cruise (Table 17). Of 3 stomachs sampled, 1 was empty and the other 2 contained euphausiids.

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Table 1. Catch of species (round weight, kg) by set by M/V SUN MAIDEN, March 10-14, 1980.

Set number	1		2		3		4		5		6		7		8		9		10	
Duration (min)	60		30		30		30		30		45		30		30		30		30	
Total catch (kg)	61		44		36		114		334		110		879		922		349		36	
	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
Lamprey[b]	-	-	-	-	-	-	-	-	1	P	-	-	-	-	-	-	-	-	-	-
Brown cat shark[b]	-	-	-	-	-	-	2	1	2	1	-	-	3	P	6	3	-	-	-	-
Spiny dogfish[b]	207	48	-	21	-	7	-	12	5	29	-	12	-	35	4	12	7	25	5	7
Ratfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pacific herring	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-	-	-
Chinook salmon[b]	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	2	4
Eulachon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northern smoothtongue	-		-	-	-	-	-	P	-	P	-	P	-	P	-	-	-	-	-	-
Lanternfish	2	P	-	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	P
Pacific cod	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pacific hake[b]	1	1	-	10	3	2	-	39	-	157	-	28	-	533	-	824	-	79	2	1
Walleye pollock[b]	-	12	-	12	35	24	95	61	-	146	-	68	-	311	-	83	-	246	-	23
Snailfish	-	-	-	-	-	-	-	-	3	P	-	-	-	-	-	-	-	-	-	-
Arrowtooth flounder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flathead sole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dover sole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
English sole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shrimp, Glass shrimp	-	-	-	P	-	-	-	P	-	-	-	P	-	P	-	-	-	-	-	-
Squid	-	-	2	1	-	-	3	2	2	1	3	1	-	P	-	-	-	-	-	-

Table 1. (cont'd.)

Set number	11		12		13		14		15		16		17		18		19		20		21		22	
Duration (min)	30		25		30		30		30		15		15		20		30		30		60		25	
Total catch (kg)	906		1593		251		500		248		434		1047		809		450		496		161		3334[a]	
	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
Lamprey[b]	1	P	-	-	-	-	2	P	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-
Brown cat shark[b]	3	P	-	-	17	7	3	1	4	P	14	6	-	-	25	10	17	6	2	2	-	-	-	-
Spiny dogfish[b]	-	207	-	53	13	12	-	108	4	10	-	48	-	325	-	58	-	139	-	27	-	-	-	150
Ratfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	1	1	-	-
Pacific herring	-	-	-	-	1	P	-	-	-	-	-	-	-	-	1	P	-	-	1	P	1	P	-	-
Chinook salmon[b]	-	-	-	-	-	-	1	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
Eulachon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	1	-	-
Northern smoothtongue	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-
Lanternfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-
Pacific cod	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pacific hake[b]	-	55	-	815	-	137	-	60	-	170	-	116	-	2	-	382	-	68	-	36	4	5	-	227[a]
Walleye pollock[b]	-	644	-	726	-	104	-	323	-	68	-	262	-	720	-	359	-	236	-	407	-	155	-	2955[a]
Snailfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arrowtooth flounder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-
Flathead sole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	3	-	-	-	-
Dover sole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-
English sole	-	-	-	-	1	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shrimp, Glass shrimp	-	-	-	-	-	-	-	-	-	P	-	P	-	-	-	P	-	-	-	P	-	P	-	-
Squid	-	-	-	-	3	1	1	P	2	1	3	1	-	-	-	P	-	P	9	3	-	-	-	-

P Present
[a] Estimated weight
[b] Samples taken

Table 2. Pollock samples collected on M/V SUN MAIDEN, March 10-14, 1980.

Location	Set no.	Number of Fish Sampled							Remarks
		Length/ Sex	Age (fin)	Mat.	Stom.	Weight	Other	Sample numbers	
E. Ballenas	1	17	-	17	-	17	10[a]	-	Total catch
E. Ballenas	2	6	-	6	-	-	7[a]	-	Total catch
W. Halibut Bank	3	14	-	14	-	9	20[a]	-	Total catch
W. Halibut Bank	4	95	-	95	-	72	-	-	Total catch
W. Halibut Bank	5	242	-	242	-	-	-	-	Total catch
Halibut Bank	6	107	-	107	-	-	-	-	Total catch
S. Halibut Bank	7	362	100	362	-	-	-	38066-38165	Total catch
S. Halibut Bank	8	126	-	126	-	-	30[b]	-	Total catch
S. Halibut Bank	9	235	100	235	-	-	9[a]	38166-38265	Total catch
S. Halibut Bank	10	36	-	36	-	-	-	-	Total catch
S.E. Halibut Bank	11	360	-	360	-	-	-	-	Random 4 tubs
S.E. Halibut Bank	12	303	200	223	-	67	-	38266-38465	Random 4 tubs
Point Grey	13	202	-	202	-	-	-	-	Total catch
Sand Heads	14	316	-	316	-	-	-	-	Random 4 tubs
Thrasher Rock	15	109	-	109	-	-	-	-	Total catch
Thrasher Rock	16	320	150	320	100	-	-	38466-38615	Random 5 tubs
Sand Heads	17	334	-	334	-	-	-	-	Random 4 tubs
Apex	18	290	-	290	-	-	-	-	Random 4 tubs
Apex	19	455	200	455	50	-	-	38616-38815	Random 6 tubs
E. Mayne I.	20	341	-	341	-	-	-	-	Random 6 tubs
E. Mayne I.	21	258	-	258	-	-	-	-	Total catch
Sand Heads	22	234	-	234	-	-	-	-	Random 4 tubs

[a] To live tank for fertilization.
[b] Ovaries frozen.

Table 3. Number and type of samples by set for species other than pollock collected on M/V SUN MAIDEN, March 10-14, 1980.

Set no.	Number of Specimens: Length	Sex	Maturity	Stomach contents	Other	Remarks
				PACIFIC HAKE		
2	34	34	34	-	-	Total catch
4	117	117	117	-	-	Total catch
5	244	244	142	-	-	Random subsample
6	48	48	48	-	-	Total catch
7	259	259	259	-	-	Total catch
12	200	200	200	-	-	Random 2 tubs
16	255	255	255	-	-	Total catch
22	234	234	234	-	-	Random 3 tubs
				SPINY DOGFISH		
1	207	207	-	-	-	Total catch
2	37	37	-	-	-	Total catch
3	22	22	-	-	-	Total catch
6	23	23	-	23	-	Total catch
11	34	34	18	34	-	Total of those >60 cm Random subsample of adults for maturity
14	19	19	19	19	-	Total catch
				BROWN CAT SHARKS		
4	2	2	-	2	-	Total catch
13	17	17	17	17	-	Total catch
16	14	14	14	14	-	Total catch
				CHINOOK SALMON		
3	1	1	-	1	-	Total catch
10	2	2	-	2	-	Total catch
14	1	1	-	-	-	Total catch
22	1	-	-	-	-	Total catch
				LAMPREY		
5	-	-	-	-	1 for live tank	Total catch
11	-	-	-	-	1 for live tank	Total catch
14	-	-	-	-	2 kept for lab	Total catch

Table 4. CPUE (kg/hr) by set for pollock, hake, and dogfish collected by M/V SUN MAIDEN, March 10-14, 1980.

	Set number										
	1	2	3	4	5	6	7	8	9	10	11
Region	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Net depth (m)	110-119	179-190	106-113	179-190	176-179	137-146	179-187	223-227	183-185	80-95	179-183
Pollock	12	24	48	121	292	91	622	166	492	46	1288
Hake	1	20	4	78	314	37	1066	1647	158	2	110
Dogfish	48	43	14	24	58	16	70	24	49	13	414

	Set number										
	12	13	14	15	16	17	18	19	20	21	22
Region	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	EMI	EMI	NMI
Net depth (m)	223-225	168-170	161-179	219-229	168	161-163	170-174	166-172	121-126	69-79	225-234
Pollock	1741	208	646	136	1048	2880	1077	472	814	155	7092
Hake	1956	274	120	340	464	8	1146	136	72	5	545
Dogfish	126	24	216	19	194	1298	173	279	54	0	360

NMI North of Mayne Island
EMI East of Mayne Island

Table 5. Maturity frequencies by sex and region for pollock collected by M/V SUN MAIDEN, March 10-14, 1980. For explanation of maturity stages see Weir et al. 1978.

Region	Sex	I1	I2	R1	R2	R	1R	2R	RR	S	Rec	Rest	Total
North of Mayne Island, net depth <130 m (sets 1, 3, 10)	M	-	-	-	2	4	-	-	4	-	-	-	10
	F	-	-	2	4	38	4	-	3	5	-	1	57
North of Mayne Island, net depth >130 m (sets 2, 4-9, 11-19, 22)	M	9	1	-	21	763	-	-	2298	35	2	-	3129
	F	2	4	1	5	316	427	63	32	28	3	7	888
East of Mayne Island, net depth <130 m (sets 20, 21)	M	-	11	-	-	15	-	-	29	3	-	-	58
	F	-	9	-	1	378	118	4	3	28	-	-	541
Total	M	9	12	-	23	782	-	-	2331	38	2	-	3197
	F	2	13	3	10	732	549	67	38	61	3	8	1486

Table 6. Maturity frequencies by sex and set for pollock collected by M/V SUN MAIDEN, March 10-14, 1980. For explanation of maturity stages see Weir et al. 1978.

Set No.	Date (March 1980)	Location	Average net depth / bottom depth (m)	Sex	I1	I2	I	R1	R2
1	10	E.Ballenas I.	114	M	-	-	-	-	1
			401	F	-	-	-	-	2
2	10	E. Ballenas I.	185	M	-	-	-	-	1
			416	F	-	-	-	-	-
3	10	W. Halibut Bank	110	M	-	-	-	-	1
			311	F	-	-	-	2	-
4	10	W. Halibut Bank	183	M	-	-	-	-	1
			366	F	-	-	-	-	-
5	11	W. Halibut Bank	179	M	4	-	-	-	-
			293	F	-	-	-	-	-
6	11	Halibut Bank	141	M	3	-	-	-	-
			256	F	-	-	-	-	-
7	11	S. Halibut Bank	183	M	-	-	-	-	14
			256	F	-	-	-	1	1
8	11	S. Halibut Bank	225	M	-	-	-	-	-
			364	F	-	-	-	-	4
9	11	S. Halibut Bank	183	M	1	1	-	-	1
			293	F	-	2	-	-	-
10	12	S. Halibut Bank	88	M	-	-	-	-	-
			375	F	-	-	-	-	2
11	12	S.E. Halibut Bank	183	M	-	-	-	-	2
			357-527	F	-	-	-	-	-
12	12	S.E. Halibut Bank	223	M	-	-	-	-	-
			293	F	-	-	-	-	-

Table 6. (cont'd.)

Set No.	Date (March 1980)	Location	R	1R	2R	RR	S	Rec	Rest	Total
1	10	E.Ballenas I.	-	-	-	-	-	-	-	1
			13	1	-	-	-	-	-	16
2	10	E. Ballenas I.	-	-	-	-	-	-	-	1
			4	-	-	-	-	-	1	5
3	10	W. Halibut Bank	-	-	-	-	-	-	-	1
			10	-	-	-	-	-	1	13
4	10	W. Halibut Bank	16	-	-	43	-	-	-	60
			29	3	1	-	-	-	2	35
5	11	W. Halibut Bank	49	-	-	156	-	-	-	209
			23	6	2	-	-	-	2	33
6	11	Halibut Bank	16	-	-	14	-	-	-	33
			50	19	-	3	1	-	1	74
7	11	S. Halibut Bank	114	-	-	188	-	-	-	316
			30	14	-	-	-	-	-	46
8	11	S. Halibut Bank	14	-	-	58	-	-	-	72
			27	17	3	3	-	-	-	54
9	11	S. Halibut Bank	37	-	-	182	-	-	-	222
			5	4	-	2	-	-	-	13
10	12	S. Halibut Bank	4	-	-	4	-	-	-	8
			15	3	-	3	5	-	-	28
11	12	S.E. Halibut Bank	111	-	-	203	3	-	-	319
			14	14	10	2	1	-	-	41
12	12	S.E. Halibut Bank	54	-	-	77	-	-	-	131
			21	66	1	2	-	1	1	92

Table 6. (cont'd.)

Set No.	Date (March 1980)	Location	Average net bottom depth (m)	Sex	I1	I2	I	R1	R2
13	12	Point Grey	170	M	1	-	-	-	-
			238	F	-	1	-	-	-
14	13	Sand Heads	165	M	-	-	-	-	-
			283	F	-	-	-	-	-
15	13	Thrasher Rock	224	M	-	-	-	-	-
			421	F	-	-	-	-	-
16	13	Thrasher Rock	168	M	-	-	-	-	2
			351	F	-	1	-	-	-
17	13	Sand Heads	161	M	-	-	-	-	-
			329	F	-	-	-	-	-
18	13	Apex	172	M	-	-	-	-	-
			220	F	1	-	-	-	-
19	14	Apex	170	M	-	-	-	-	-
			256	F	1	-	-	-	-
20	14	E. Mayne I.	123	M	-	4	-	-	-
			139	F	-	4	-	-	-
21	14	E. Mayne I.	77	M	-	7	-	-	-
			146	F	-	5	-	-	1
22	14	Sand Heads	229	M	-	-	-	-	-
			298	F	-	-	-	-	-

Table 6. (cont'd.)

Set No.	Date (March 1980)	Location	R	1R	2R	RR	S	Rec	Rest	Total
13	12	Point Grey	28	-	-	84	-	-	-	113
			5	76	4	-	3	-	-	89
14	13	Sand Heads	73	-	-	177	8	2	-	260
			12	31	6	2	5	-	-	56
15	13	Thrasher Rock	11	-	-	48	-	-	-	59
			10	27	11	-	-	2	-	50
16	13	Thrasher Rock	89	-	-	174	11	-	-	276
			7	24	8	2	3	-	-	45
17	13	Sand Heads	27	-	-	298	1	-	-	326
			3	4	-	-	1	-	-	8
18	13	Apex	78	-	-	107	-	-	-	185
			38	49	1	7	9	-	-	105
19	14	Apex	32	-	-	347	7	-	-	386
			22	33	6	2	5	-	-	69
20	14	E. Mayne I.	9	-	-	22	1	-	-	36
			214	79	1	2	5	-	-	305
21	14	E. Mayne I.	6	-	-	7	2	-	-	22
			164	39	3	1	23	-	-	236
22	14	Sand Heads	14	-	-	142	5	-	-	161
			16	40	10	7	-	-	-	73

Table 7. Length frequency by region of pollock collected by M/V SUN MAIDEN, March 10-14, 1980.

Fork length (cm)	North of Mayne Island, net depth <130 m (sets 1, 3, 10)					North of Mayne Island, net depth depth >130 m (sets 2,4-9,11-19,22)				
	M		F		T	M		F		T
	I	I + M	I	I + M		I	I + M	I	I + M	
28	-	-	-	-	-	-	1	-	-	1
29	-	-	-	-	-	-	4	-	-	4
30	-	-	-	-	-	2	10	1	2	12
31	-	-	-	-	-	3	15	0	1	16
32	-	-	-	-	-	2	17	1	1	18
33	-	-	-	-	-	1	34	2	3	37
34	-	-	-	-	-	0	65	1	8	73
35	-	-	-	-	-	0	137	0	12	149
36	-	1	-	1	2	1	233	0	36	269
37	-	0	-	3	3	0	242	0	50	292
38	-	0	-	2	2	0	236	1	73	309
39	-	0	-	2	2	0	239	-	72	311
40	-	0	-	4	4	0	377	-	56	433
41	-	2	-	4	6	1	414	-	57	471
42	-	2	-	6	8	-	365	-	65	430
43	-	3	-	6	9	-	259	-	72	331
44	-	1	-	7	8	-	209	-	74	283
45	-	1	-	9	10	-	105	-	80	185
46	-	-	-	7	7	-	72	-	57	129
47	-	-	-	5	5	-	52	-	34	86
48	-	-	-	0	0	-	35	-	47	82
49	-	-	-	1	1	-	26	-	39	65
50	-	-	-	-	-	-	12	-	28	40
51	-	-	-	-	-	-	6	-	23	29
52	-	-	-	-	-	-	2	-	13	15
53	-	-	-	-	-	-	4	-	9	13
54	-	-	-	-	-	-	1	-	6	7
55	-	-	-	-	-	-	-	-	5	5
56	-	-	-	-	-	-	-	-	0	0
57	-	-	-	-	-	-	-	-	1	1
58	-	-	-	-	-	-	-	-	0	0
59	-	-	-	-	-	-	-	-	0	0
60	-	-	-	-	-	-	-	-	1	1
61	-	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-	-
Total	0	10	0	57	67	10	3172	6	925	4097
Sex Ratio (%Female)				85					23	

Table 7. (cont'd)

Fork length (cm)	East of Mayne Island, net depth <130 m (sets 20,21)				
	M		F		T
	I	I + M	I	I + M	
28	-	1	-	-	1
29	-	0	-	-	0
30	-	1	1	1	2
31	2	3	0	0	3
32	1	4	0	1	5
33	2	7	0	1	8
34	3	6	2	9	15
35	2	4	1	13	17
36	1	3	2	27	30
37	-	2	0	51	53
38	-	7	1	48	55
39	-	2	2	62	64
40	-	5	-	25	30
41	-	1	-	26	27
42	-	5	-	30	35
43	-	3	-	44	47
44	-	2	-	31	33
45	-	1	-	19	20
46	-	1	-	28	29
47	-	-	-	15	15
48	-	-	-	17	17
49	-	-	-	19	19
50	-	-	-	18	18
51	-	-	-	20	20
52	-	-	-	14	14
53	-	-	-	10	10
54	-	-	-	3	3
55	-	-	-	4	4
56	-	-	-	4	4
57	-	-	-	0	0
58	-	-	-	0	0
59	-	-	-	0	0
60	-	-	-	0	0
61	-	-	-	0	0
62	-	-	-	0	0
63	-	-	-	1	1
Total	11	58	9	541	599
Sex Ratio (%Female)			90		

I = Immature.
M = Mature.

Table 8. Length frequency by set of pollock collected by M/V SUN MAIDEN, March 10-14, 1980.

Fork length (cm)	Set no. and net depth (m)								
	1 110-119			2 179-190			3 106-113		
	M	F	T	M	F	T	M	F	T
28	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-
36	-	1	1	-	-	-	-	-	-
37	-	0	0	-	-	-	-	-	-
38	-	0	0	-	-	-	-	-	-
39	-	0	0	-	-	-	-	1	1
40	-	0	0	-	-	-	-	0	0
41	1	3	4	-	-	-	-	2	2
42	-	3	3	-	1	1	1	1	2
43	-	2	2	1	2	3	-	1	1
44	-	2	2	-	0	0	-	4	4
45	-	1	1	-	0	0	-	4	4
46	-	1	1	-	2	2	-	-	-
47	-	3	3	-	-	-	-	-	-
48	-	-	-	-	-	-	-	-	-
49	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-
Total	1	16	17	1	5	6	1	13	14

Table 8. (cont'd)

Fork length (cm)	Set no. and net depth (m)								
	4 179-190			5 176-179			6 137-146		
	M	F	T	M	F	T	M	F	T
28	-	-	-	-	-	-	-	-	-
29	-	-	-	1	-	1	-	-	-
30	-	-	-	1	-	1	1	-	1
31	-	-	-	4	-	4	0	1	1
32	-	-	-	0	-	0	2	0	2
33	-	-	-	1	-	1	0	0	0
34	1	-	1	1	-	1	0	0	0
35	0	-	0	3	1	4	2	2	4
36	2	2	4	6	3	9	2	4	6
37	1	2	3	8	0	8	1	2	3
38	3	1	4	11	1	12	3	8	11
39	1	3	4	6	5	11	1	3	4
40	7	1	8	28	2	30	3	7	10
41	10	1	11	30	2	32	2	3	5
42	13	1	14	33	2	35	5	7	12
43	8	2	10	32	2	34	8	6	14
44	10	5	15	33	4	37	3	9	12
45	2	6	8	8	4	12	-	8	8
46	1	4	5	1	2	3	-	9	9
47	1	1	2	2	3	5	-	3	3
48	-	1	1	-	1	1	-	0	0
49	-	3	3	-	0	0	-	2	2
50	-	1	1	-	1	1	-	-	-
51	-	1	1	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-
Total	60	35	95	209	33	242	33	74	107

Table 8. (cont'd)

Fork length (cm)	Set no. and net depth (m)								
	7 179-187			8 223-227			9 183-185		
	M	F	T	M	F	T	M	F	T
28	1	-	1	-	-	-	-	-	-
29	1	-	1	-	-	-	-	-	-
30	0	-	0	-	-	-	2	1	3
31	0	-	0	-	-	-	1	0	1
32	1	-	1	-	-	-	2	0	2
33	4	-	4	-	-	-	7	0	7
34	4	1	5	3	1	4	4	1	5
35	11	0	11	4	0	4	14	1	15
36	22	2	24	4	1	5	16	1	17
37	24	0	24	4	1	5	12	1	13
38	19	5	24	4	0	4	12	3	15
39	25	6	31	5	8	13	19	0	19
40	37	3	40	7	2	9	35	1	36
41	61	2	63	7	5	12	29	0	29
42	55	5	60	12	4	16	19	0	19
43	26	6	32	8	5	13	18	0	18
44	16	7	23	8	5	13	18	0	18
45	5	6	11	4	3	7	5	1	6
46	3	0	3	0	1	1	4	1	5
47	0	0	0	1	3	4	2	0	2
48	0	0	0	0	5	5	2	2	4
49	0	0	0	1	3	4	1	-	1
50	1	2	3	-	3	3	-	-	-
51	-	1	1	-	1	1	-	-	-
52	-	-	-	-	1	1	-	-	-
53	-	-	-	-	1	1	-	-	-
54	-	-	-	-	1	1	-	-	-
55	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-
Total	316	46	362	72	54	126	222	13	235

Table 8. (cont'd.)

Fork length (cm)	Set no. and net depth (m)								
	10 80-95			11 179-187			12 223-225		
	M	F	T	M	F	T	M	F	T
28	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-
32	-	-	-	1	-	1	2	-	2
33	-	-	-	2	-	2	2	-	2
34	-	-	-	3	-	3	4	-	4
35	-	-	-	12	-	12	12	1	13
36	1	-	1	36	2	38	20	8	28
37	0	3	3	30	2	32	14	7	21
38	0	2	2	38	2	40	22	11	33
39	0	2	2	30	3	33	11	5	16
40	0	3	3	43	0	43	18	6	24
41	1	1	2	36	3	39	24	9	33
42	2	1	3	34	1	35	17	14	31
43	2	3	5	18	4	22	15	9	24
44	1	4	5	21	8	29	5	12	17
45	1	4	5	7	3	10	1	10	11
46	-	2	2	4	3	7	4	4	8
47	-	2	2	0	2	2	1	5	6
48	-	0	0	1	5	6	1	8	9
49	-	1	1	2	1	3	0	4	4
50	-	-	-	1	1	2	1	5	6
51	-	-	-	-	0	0	-	4	4
52	-	-	-	-	0	0	-	3	3
53	-	-	-	-	0	0	-	2	2
54	-	-	-	-	1	1	-	2	2
55	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-
Total	8	28	36	319	41	360	174	129	303

Table 8. (cont'd.)

Fork length (cm)	Set no. and net depth (m)								
	13 168-170			14 161-179			15 220-229		
	M	F	T	M	F	T	M	F	T
28	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-
31	2	-	2	-	-	-	-	-	-
32	2	1	3	-	-	-	-	-	-
33	3	1	4	3	-	3	-	-	-
34	3	0	3	9	1	10	1	-	1
35	10	0	10	12	2	14	4	-	4
36	10	1	11	23	0	23	4	3	7
37	12	3	15	24	2	26	7	4	11
38	10	6	16	20	8	28	7	3	10
39	10	5	15	25	4	29	5	3	8
40	15	6	21	37	7	44	7	2	9
41	3	7	10	31	4	35	8	3	11
42	12	7	19	27	3	30	6	5	11
43	13	8	21	24	3	27	2	6	8
44	2	3	5	11	6	17	5	5	10
45	2	11	13	5	5	10	0	4	4
46	0	7	7	2	3	5	1	5	6
47	2	6	8	5	2	7	1	3	4
48	0	6	6	1	1	2	1	1	2
49	1	4	5	1	2	3	-	1	1
50	1	1	2	-	0	0	-	1	1
51	-	2	2	-	2	2	-	0	0
52	-	4	4	-	0	0	-	0	0
53	-	-	-	-	1	1	-	0	0
54	-	-	-	-	-	-	-	1	1
55	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-
Total	113	89	202	260	56	316	59	50	109

Table 8. (cont'd.)

Fork length (cm)	Set no. and net depth (m)								
	16 168			17 161-163			18 170-174		
	M	F	T	M	F	T	M	F	T
28	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	1	-	1
30	1	1	2	-	-	-	0	-	0
31	2	0	2	-	-	-	1	-	1
32	1	0	1	1	-	1	2	-	2
33	3	0	3	1	-	1	2	1	3
34	11	0	11	3	-	3	4	2	6
35	12	1	13	6	-	6	15	2	17
36	19	2	21	11	-	11	17	3	20
37	27	4	31	18	-	18	11	8	19
38	14	4	18	22	-	22	12	7	19
39	14	4	18	24	-	24	16	13	29
40	32	5	37	32	-	32	19	8	27
41	45	2	47	39	2	41	27	8	35
42	37	3	40	31	1	32	24	4	28
43	18	6	23	18	0	18	9	6	15
44	15	2	17	17	0	17	12	3	15
45	10	4	14	23	1	24	4	5	9
46	5	4	9	25	0	25	4	3	7
47	5	1	6	12	0	12	3	3	6
48	3	0	3	17	2	19	0	7	7
49	0	1	1	14	0	14	2	10	12
50	1	1	2	3	1	4	-	4	4
51	0	-	0	4	1	5	-	1	1
52	0	-	0	1	-	1	-	1	1
53	0	-	0	4	-	4	-	1	1
54	1	-	1	-	-	-	-	0	0
55	-	-	-	-	-	-	-	4	4
56	-	-	-	-	-	-	-	0	0
57	-	-	-	-	-	-	-	0	0
58	-	-	-	-	-	-	-	0	0
59	-	-	-	-	-	-	-	0	0
60	-	-	-	-	-	-	-	1	1
61	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-
Total	276	45	320	326	8	334	185	105	290

Table 8. (cont'd.)

Fork Length (cm)	Set no. and net depth (m)								
	19 164-172			20 121-126			21 69-79		
	M	F	T	M	F	T	M	F	T
28	-	-	-	-	-	-	1	-	1
29	1	-	1	-	-	-	0	-	0
30	5	-	5	1	1	2	0	-	0
31	5	-	5	1	0	1	2	-	2
32	3	-	3	1	0	1	3	1	4
33	6	1	7	3	0	3	4	1	5
34	14	1	15	2	4	6	4	5	9
35	18	2	20	2	7	9	2	6	8
36	33	3	36	3	12	15	0	15	15
37	40	11	51	1	18	19	1	33	34
38	28	12	40	3	25	28	4	23	27
39	37	8	45	2	22	24	0	40	40
40	43	3	46	5	10	15	0	15	15
41	47	4	51	1	12	13	0	14	14
42	24	2	26	5	17	22	0	13	13
43	28	3	31	2	20	22	1	24	25
44	17	0	17	2	17	19	-	14	14
45	14	3	17	1	11	12	-	8	8
46	8	3	11	1	22	23	-	6	6
47	5	2	7	-	13	13	-	2	2
48	6	2	8	-	13	13	-	4	4
49	1	1	2	-	18	18	-	1	1
50	2	2	4	-	15	15	-	3	3
51	0	3	3	-	17	17	-	3	3
52	1	1	2	-	12	12	-	2	2
53	-	0	0	-	9	9	-	1	1
54	-	0	0	-	3	3	-	0	0
55	-	1	1	-	4	4	-	0	0
56	-	0	0	-	3	3	-	1	1
57	-	1	1	-	-	-	-	0	0
58	-	-	-	-	-	-	-	0	0
59	-	-	-	-	-	-	-	0	0
60	-	-	-	-	-	-	-	0	0
61	-	-	-	-	-	-	-	0	0
62	-	-	-	-	-	-	-	0	0
63	-	-	-	-	-	-	-	1	1
Total	386	69	455	36	305	341	22	236	258

Table 8. (cont'd.)

Fork length (cm)	Set no and net depth (m) 22 225-234 M	F	T	TOTAL M	F	T
28	-	-	-	2	-	2
29	-	-	-	4	-	4
30	-	-	-	11	3	14
31	-	-	-	18	1	19
32	-	-	-	21	2	23
33	-	-	-	41	4	45
34	-	1	1	71	17	88
35	2	0	2	141	25	166
36	8	1	9	237	64	301
37	9	3	12	244	104	348
38	11	2	13	243	123	366
39	10	2	12	241	136	377
40	14	3	17	382	85	467
41	15	2	17	417	87	504
42	16	5	21	372	101	473
43	13	4	17	265	122	387
44	16	5	21	212	112	324
45	15	6	21	107	108	215
46	10	6	16	73	92	165
47	12	0	12	52	54	106
48	3	6	9	35	64	99
49	3	7	10	26	59	85
50	2	5	7	12	46	58
51	2	7	9	6	43	49
52	-	3	3	2	27	29
53	-	4	4	4	19	23
54	-	1	1	1	9	10
55	-	-	-	-	9	9
56	-	-	-	-	4	4
57	-	-	-	-	1	1
58	-	-	-	-	0	0
59	-	-	-	-	0	0
60	-	-	-	-	1	1
61	-	-	-	-	0	0
62	-	-	-	-	0	0
63	-	-	-	-	1	1
Total	161	73	234	3,240	1,523	4,763

Table 9. Length frequency (number of fish) by age of pollock collected by the commercial roe fishery at depths <130 m in minor area 29 during February 1980. Six samples combined.

Fork length (cm)	Age (years) 2 M	2 F	3 M	3 F	4 M	4 F	5 M	5 F	6 M	6 F	7 M	7 F	8 M	8 F
30	1	-	-	-	-	-	-		-	-	-	-	-	-
31	0	1	1	-	1	-	-		-	-	-	-	-	-
32	0	0	0	-	0	-	-		-	-	-	-	-	-
33	1	1	7	2	0	-	-		-	-	-	-	-	-
34	-	-	10	1	1	-	-		-	-	-	-	-	-
35	-	-	23	6	4	-	-		-	-	-	-	-	-
36	-	-	29	20	6	-	-		-	-	-	-	-	-
37	-	-	28	23	2	-	-	1	-	-	-	-	-	-
38	-	-	25	20	7	3	3	1	-	-	-	-	-	-
39	-	-	33	24	18	2	8	1	1	-	1	-	-	-
40	-	-	10	8	25	3	14	0	4	-	0	-	-	-
41	-	-	6	8	19	8	6	7	3	-	1	-	-	-
42	-	-	4	4	14	8	5	5	5	2	1	1	-	-
43	-	-	3	2	5	7	5	6	0	1	0	1	-	-
44	-	-	-	-	2	3	3	2	0	0	1	0	-	1
45	-	-	-	-	-	5	3	5	1	1	-	0	-	-
46	-	-	-	-	-	2	2	1	-	1	-	0	-	-
47	-	-	-	-	-	0	-	1	-	1	-	0	-	-
48	-	-	-	-	-	1	-	5	-	-	-	0	-	-
49	-	-	-	-	-	-	-	-	-	1	-	0	-	-
50	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Total	2	2	179	118	104	42	49	35	14	7	4	3	-	1
Mean	31.5	32.0	37.2	38.0	39.7	42.2	41.1	43.3	41.2	44.9	41.5	45.0	-	44.0

Number aged as ranges: 40
Number missing or unreadable: 0

Table 10. Length frequency (number of fish) by age of pollock collected by the commercial roe fishery in minor area 18 (east of Mayne Island) during March 1980. Five samples combined.

Fork length (cm)	Age (years)													
	3		4		5		6		7		8		9	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
33	1	1	-	-	-	-	-	-	-	-	-	-	-	-
34	0	0	-	-	-	-	-	-	-	-	-	-	-	-
35	2	1	-	1	-	-	-	-	-	-	-	-	-	-
36	1	7	2	0	-	-	-	-	-	-	-	-	-	-
37	3	12	0	3	-	-	-	-	-	-	-	-	-	-
38	0	12	1	1	-	-	-	-	-	-	-	-	-	-
39	2	9	2	5	1	-	-	1	-	-	-	-	-	-
40	1	6	1	2	2	3	1	1	0	-	-	-	-	-
41	-	3	3	4	2	4	0	1	0	-	1	-	-	-
42	-	4	1	8	2	9	1	5	0	1	-	-	1	-
43	-	3	-	10	3	13	1	1	0	1	-	-	-	-
44	-	-	-	5	3	15	1	12	0	1	-	-	-	-
45	-	-	-	4	2	7	2	3	0	2	-	-	-	-
46	-	-	-	7	0	12	2	6	3	4	-	2	-	-
47	-	-	-	3	0	13	3	0	2	3	-	0	-	-
48	-	-	-	1	1	10	1	2	-	7	-	2	-	-
49	-	-	-	0	-	15	0	8	-	16	-	3	-	-
50	-	-	-	0	-	8	1	6	-	16	-	1	-	-
51	-	-	-	1	-	4	-	7	-	5	-	4	-	-
52	-	-	-	0	-	4	-	8	-	12	-	5	-	-
53	-	-	-	0	-	1	-	6	-	5	-	3	-	-
54	-	-	-	1	-	0	-	3	-	1	-	2	-	-
55	-	-	-	-	-	1	-	-	-	1	-	0	-	-
56	-	-	-	-	-	-	-	-	-	1	-	1	-	-
57	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Total	10	58	10	56	16	119	13	70	6	80	1	23	1	-
Mean	36.8	38.5	39.3	42.9	42.7	46.2	45.4	47.9	45.2	50.1	41.0	51.0	42.0	-

Number aged as ranges: 36
Number missing or unreadable: 1

Table 11. Length frequency (number of fish) by age of pollock collected near Halibut Bank at depths >130 m by M/V SUN MAIDEN during March 10-14, 1980. Three samples combined (sets 7,9,12).

Fork Length (cm)	Age (years)													
	2		3		4		5		6		7		8	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
28	1	-	-	-	-	-	-	-	-	-	-	-	-	-
29	0	-	-	-	-	-	-	-	-	-	-	-	-	-
30	0	1	-	-	-	-	-	-	-	-	-	-	-	-
31	0	-	-	-	-	-	-	-	-	-	-	-	-	-
32	1	-	-	-	-	-	-	-	-	-	-	-	-	-
33	-	-	5	-	-	-	-	-	-	-	-	-	-	-
34	-	-	5	-	-	-	-	-	-	-	-	-	-	-
35	-	-	13	1	3	-	-	-	-	-	-	-	-	-
36	-	-	22	7	1	-	-	-	-	-	-	-	-	-
37	-	-	20	6	3	-	-	-	-	-	-	-	-	-
38	-	-	21	8	2	-	3	1	-	-	-	-	-	-
39	-	-	7	5	4	-	1	0	-	-	-	-	-	-
40	-	-	13	4	17	3	5	0	1	-	-	-	-	-
41	-	-	12	1	15	2	9	2	1	-	-	-	1	-
42	-	-	1	2	14	2	12	3	1	-	-	-	0	-
43	-	-	2	-	5	0	7	4	5	-	-	-	3	-
44	-	-	-	-	3	2	4	3	2	3	1	-	0	-
45	-	-	-	-	1	2	2	2	0	1	1	-	0	-
46	-	-	-	-	-	1	1	1	4	0	2	-	0	-
47	-	-	-	-	-	0	0	1	0	1	1	1	0	-
48	-	-	-	-	-	1	0	4	1	1	-	2	0	-
49	-	-	-	-	-	-	0	1	-	0	-	1	0	1
50	-	-	-	-	-	-	1	1	-	1	-	3	-	-
51	-	-	-	-	-	-	-	0	-	1	-	2	-	-
52	-	-	-	-	-	-	-	1	-	1	-	0	-	-
53	-	-	-	-	-	-	-	1	-	-	-	1	-	-
Total	2	1	121	34	68	13	45	25	15	9	5	10	4	1
Mean	30.0	30.0	37.5	38.0	40.6	42.9	42.0	45.2	43.9	47.2	45.6	49.7	42.5	49.0

Number aged as ranges: 46
Number missing or unreadable: 1

Table 12. Length frequency (number of fish) by age of pollock collected by the commercial roe fishery at depths >130 m in minor area 29 near Sand Heads during March 1980. One sample used.

Fork Length (cm)	Age (years)													
	3		4		5		6		7		8		9	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
35	-	-	-	-	1	-	-	-	-	-	-	-	-	-
36	1	-	-	-	0	-	-	-	-	-	-	-	-	-
37	3	1	-	-	0	-	-	-	-	-	-	-	-	-
38	0	0	-	-	0	-	-	-	-	-	-	-	-	-
39	0	1	-	1	0	-	1	-	-	-	-	-	-	-
40	1	-	-	0	0	-	1	-	-	-	-	-	-	-
41	1	-	1	0	5	-	0	-	-	-	-	-	-	-
42	-	-	1	0	1	-	0	-	-	-	-	-	-	-
43	-	-	3	1	2	-	1	-	-	-	-	-	-	-
44	-	-	0	1	3	2	0	-	-	-	-	1	-	-
45	-	-	0	3	2	0	1	-	1	1	-	0	-	-
46	-	-	1	2	0	0	0	1	0	0	-	0	-	-
47	-	-	-	1	0	1	1	0	0	2	-	0	-	-
48	-	-	-	1	1	2	2	0	1	1	-	0	-	-
49	-	-	-	-	-	4	-	2	-	0	-	0	-	-
50	-	-	-	-	-	3	-	0	-	1	1	0	-	-
51	-	-	-	-	-	3	-	4	-	4	-	0	-	1
52	-	-	-	-	-	-	-	1	-	1	-	0	-	-
53	-	-	-	-	-	-	-	1	-	2	-	0	-	-
54	-	-	-	-	-	-	-	-	-	0	-	1	-	-
55	-	-	-	-	-	-	-	-	-	0	-	0	-	-
56	-	-	-	-	-	-	-	-	-	1	-	1	-	-
Total	6	2	6	10	15	15	7	9	2	13	1	3	-	1
Mean	38.0	38.0	43.0	44.8	42.5	48.7	44.3	50.3	46.5	50.4	50.0	51.3	-	51.0

Number aged as ranges: 10
Number missing or unreadable: 0

Table 13. Length frequency by sex and set of Pacific hake collected by M/V SUN MAIDEN, March 10-14, 1980.

Fork length (cm)	Set no. and net depth (m)																													
	2 179-190				4 179-190				5 176-179			6 137-146			7 179-187			12 223-225			16 168			22 225-234			Total			
	M	F	U	T	M	F	U	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	U	T
9	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
10	-	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
11	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
12	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
13	-	-	2	2	-	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5
14	-	-	1	1	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
15	-	-	-	0	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
16	-	-	-	0	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
17	-	-	-	0	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
18	1	-	-	1	-	-	-	0	-	-	-	-	1	1	-	1	1	-	-	-	-	-	-	-	-	-	1	2	-	3
19	2	-	-	2	-	1	-	1	2	2	4	-	0	0	-	1	1	-	-	-	2	-	2	-	-	-	6	4	-	10
20	1	-	-	1	3	2	-	5	0	1	1	-	0	0	2	2	4	-	-	-	1	1	2	-	-	-	7	6	-	13
21	1	-	-	1	4	2	-	6	2	2	4	-	0	0	2	3	5	-	-	-	0	5	5	-	-	-	9	12	-	21
22	0	-	-	0	4	6	-	10	1	3	4	-	0	0	1	3	4	-	2	2	1	5	6	-	-	-	7	19	-	26
23	0	-	-	0	5	4	-	9	3	4	7	-	0	0	3	2	5	-	1	1	2	2	4	-	-	-	13	13	-	26
24	0	-	-	0	3	0	-	3	2	1	3	-	0	0	4	3	7	1	0	1	1	2	3	-	-	-	11	6	-	17
25	0	-	-	0	2	1	-	3	4	1	5	-	0	0	1	1	2	1	0	1	1	0	1	-	-	-	9	3	-	12
26	0	-	-	0	2	4	-	6	2	2	4	-	0	0	1	2	3	0	0	0	0	1	1	-	-	-	5	9	-	14
27	1	-	-	1	2	2	-	4	4	3	7	-	0	0	1	2	3	0	0	0	0	2	2	-	-	-	8	9	-	17
28	0	-	-	0	1	1	-	2	1	0	1	-	0	0	1	0	1	0	0	0	1	?	3	2	-	2	6	3	-	9
29	0	-	-	0	1	1	-	2	0	1	1	-	0	0	0	0	0	0	0	0	0	0	0	0	-	0	1	2	-	3
30	0	1	-	1	0	0	-	0	1	1	2	-	0	0	0	0	0	1	0	1	1	0	1	0	1	1	3	3	-	6
31	0	0	-	0	1	0	-	1	0	1	1	-	0	0	2	0	2	0	0	0	0	0	0	0	0	0	3	1	-	4
32	0	0	-	0	0	0	-	0	4	0	4	-	2	2	0	0	0	1	0	1	1	0	1	0	0	0	6	2	-	8
33	0	1	-	1	1	0	-	1	6	0	6	-	3	3	11	1	12	1	0	1	5	0	5	0	0	0	24	5	-	29
34	1	0	-	1	1	1	-	2	11	0	11	-	5	5	14	0	14	10	1	11	2	0	2	1	1	2	40	8	-	48

Table 13. (cont'd)

Fork length (cm)	Set no. and net depth (m)																													
	2 179–190				4 179–190				5 176–179			6 137–146			7 179–187			12 223–225			16 168			22 225–234			Total			
	M	F	U	T	M	F	U	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	U	T
35	0	1	–	1	0	2	–	2	23	3	26	–	6	6	25	1	26	6	0	6	6	1	7	0	1	1	60	15	–	75
36	1	0	–	1	1	0	–	1	18	1	19	–	9	9	22	2	24	5	1	6	10	0	10	3	0	3	60	13	–	73
37	1	1	–	2	2	0	–	2	10	1	11	–	3	3	12	0	12	10	0	10	7	0	7	6	1	7	48	6	–	54
38	0	0	–	0	0	0	–	0	14	1	15	1	0	1	8	2	10	5	0	5	10	0	10	3	0	3	41	3	–	44
39	0	1	–	1	2	1	–	3	7	2	9	0	1	1	11	0	11	8	0	8	10	0	10	0	0	0	38	5	–	43
40	0	1	–	1	0	3	–	3	6	1	7	0	3	3	5	2	7	9	1	10	13	0	13	5	1	6	38	12	–	50
41	0	0	–	0	1	2	–	3	11	0	11	0	1	1	11	0	11	10	1	11	14	0	14	10	2	12	57	6	–	63
42	0	0	–	0	2	0	–	2	9	3	12	0	0	0	15	0	15	12	0	12	28	0	28	18	1	19	84	4	–	88
43	0	1	–	1	1	2	–	3	20	2	22	0	1	1	19	0	19	18	0	18	27	0	27	26	4	30	111	10	–	121
44	0	0	–	0	1	8	–	9	9	2	11	1	2	3	14	3	17	17	3	20	27	5	32	18	10	28	87	33	–	120
45	0	0	–	0	1	13	–	14	8	5	13	0	0	0	13	0	13	18	10	28	19	8	27	26	14	40	85	50	–	135
46	0	3	–	3	0	6	–	6	5	0	5	0	4	4	14	1	15	7	4	11	9	5	14	16	11	27	51	34	–	85
47	1	1	–	2	1	1	–	2	8	2	10	3	–	3	6	4	10	6	4	10	5	4	9	12	8	20	42	24	–	66
48	–	0	–	0	–	4	–	4	3	1	4	2	–	2	2	1	3	2	5	7	3	1	4	8	8	16	20	20	–	40
49	–	1	–	1	–	1	–	1	0	1	1	–	–	–	2	–	2	1	2	3	0	3	3	1	3	4	4	11	–	15
50	–	0	–	0	–	1	–	1	1	0	1	–	–	–	–	–	–	0	3	3	0	0	0	2	0	2	3	4	–	7
51	–	3	–	3	–	3	–	3	1	0	1	–	–	–	–	–	–	1	1	2	1	0	1	0	3	3	3	10	–	13
52	–	–	–	–	–	0	–	0	–	0	0	–	–	–	–	–	–	–	1	1	–	0	0	1	2	3	1	3	–	4
53	–	–	–	–	–	0	–	0	–	0	0	–	–	–	–	–	–	–	1	1	–	0	0	–	1	1	–	2	–	2
54	–	–	–	–	–	1	–	1	–	0	0	–	–	–	–	–	–	–	1	1	–	0	0	–	0	0	–	2	–	2
55	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	–	–	–	0	0	–	0	0	–	1	1	–	1	–	1
56	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	–	–	–	0	0	–	0	0	–	0	0	–	0	–	0
57	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	–	–	–	0	0	–	0	0	–	0	0	–	0	–	0
58	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	–	–	–	0	0	–	0	0	–	0	0	–	0	–	0
59	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	–	–	–	0	0	–	0	0	–	0	0	–	0	–	0
60	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	–	–	–	0	0	–	0	0	–	0	0	–	0	–	0
61	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	0	0	–	0	0	–	0	0	–	1	–	1

Table 13. (cont'd)

Fork length (cm)	Set no. and net depth (m)																													
	2 179–190				4 179–190				5 176–179			6 137–146			7 179–187			12 223–225			16 168			22 225–234			Total			
	M	F	U	T	M	F	U	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	U	T
62	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	1	1	–	0	0	–	2	–	2
63	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	0	0	–	1	–	1
64	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	0	0	–	0	–	0
65	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	0	0	–	1	–	1
66	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	0	0	–	0	–	0
67	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	0	0	–	0	–	0
68	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	0	0	–	0	–	0
69	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	0	0	–	0	–	0
70	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	3	3	–	3	–	3
71	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	–	–	–	0	–	0
72	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	–	–	–	0	–	0
73	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	1	–	1
Total	10	15	9	34	42	73	3	118	196	48	244	7	41	48	222	37	259	150	46	196	207	48	255	158	76	234	992	384	12	1,388

Table 14. Maturity frequencies by sex and set of Pacific hake collected by M/V SUN MAIDEN, March 10-14, 1980. For explanation of maturity stages see Weir et al. 1978.

Set no.	Date (March 1980)	Location	Average depth(m) net / bottom	Sex	I1	I2	I	R1	R2
2	10	E. Ballenas	185 / 416	M	7	-	-	2	1
				F	3	2	-	1	9
				U	-	-	9	-	-
4	10	W. Halibut Bank	183 / 366	M	34	1	-	1	5
				F	25	1	-	11	30
				U	-	-	3	-	-
5	11	W. Halibut Bank	179 / 293	M	22	9	-	3	1
				F	18	-	-	-	1
6	11	Halibut Bank	141 / 256	M	-	-	-	-	6
				F	5	20	-	9	6
7	11	S. Halibut Bank	183 / 256	M	16	46	-	-	-
				F	17	8	-	-	-
12	12	S.E. Halibut Bank	223 / 293	M	3	10	-	-	-
				F	3	1	-	-	1
16	13	Thrasher Rk.	168 / 351	M	10	13	-	-	-
				F	18	3	-	7	-
22	14	Sand Heads	229 / 298	M	2	4	-	-	-
				F	-	4	-	-	-
TOTAL				M	94	103	-	6	13
				F	89	39	-	28	47
				U	-	-	12	-	-

Table 14. (cont'd.)

Set no.	Date (March 1980)	Location	Sex	R	1R	2R	RR	S	Resb	Rec/Rest	Total
2	10	E. Ballenas	M	-	-	-	-	-	-	-	10
			F	-	-	-	-	-	-	-	15
			U	-	-	-	-	-	-	-	9
4	10	W. Halibut Bank	M	1	-	-	-	-	-	-	42
			F	5	-	-	-	-	-	-	72
			U	-	-	-	-	-	-	-	3
5	11	W. Halibut Bank	M	3	-	-	20	12	-	16	106
			F	16	-	-	-	-	1	-	36
6	11	Halibut Bank	M	1	-	-	-	-	-	-	7
			F	1	-	-	-	-	-	-	41
7	11	S. Halibut Bank	M	19	-	-	114	-	-	27	222
			F	8	2	-	-	2	-	-	37
12	12	S.E. Halibut Bank	M	17	-	-	90	24	-	10	154
			F	29	3	5	-	4	-	-	46
16	13	Thrasher Rk.	M	20	-	-	143	-	-	21	207
			F	20	-	-	-	-	-	-	48
22	14	Sand Heads	M	7	-	-	117	25	-	3	158
			F	58	2	4	1	7	-	-	76
TOTAL			M	68	-	-	484	61	-	77	906
			F	137	7	9	1	13	1	-	371
			U	-	-	-	-	-	-	-	12

Table 15. Length frequency by sex and set of spiny dogfish collected by M/V SUN MAIDEN, March 10-14, 1980.

Total length (cm)	Set no. and net depth (m)											
	1			2			3			6		
	110-119			179-190			106-113			137-146		
	M	F	T	M	F	T	M	F	T	M	F	T
30	-	1	1	-	-	-	-	-	-	-	-	-
31	2	2	4	-	-	-	-	-	-	-	-	-
32	4	4	8	-	-	-	-	-	-	-	1	1
33	11	14	25	-	1	1	-	-	-	-	1	1
34	9	18	27	-	2	2	1	1	2	-	0	0
35	9	10	19	2	0	2	1	0	1	1	0	1
36	18	12	30	1	0	1	1	1	2	2	2	4
37	11	12	23	1	2	3	0	5	5	0	0	0
38	11	11	22	2	2	4	0	0	0	0	1	1
39	6	8	14	0	0	0	0	4	4	0	1	1
40	8	3	11	0	1	1	0	1	1	1	1	2
41	5	3	8	0	0	0	0	1	1	0	0	0
42	0	0	0	2	1	3	0	0	0	0	1	1
43	1	1	2	2	2	4	1	0	1	0	0	0
44	2	3	5	3	0	3	0	0	0	0	0	0
45	0	2	2	0	0	0	0	2	2	2	0	2
46	1	0	1	0	0	0	0	-	0	0	0	0
47	1	0	1	1	0	1	0	-	0	1	0	1
48	0	0	0	0	0	0	0	-	0	0	0	0
49	1	0	1	0	0	0	1	-	1	0	1	1
50	-	1	1	1	0	1	0	-	0	2	0	2
51	-	0	0	1	0	1	0	-	0	0	1	1
52	-	0	0	0	0	0	0	-	0	0	0	0
53	-	1	1	1	0	1	0	-	0	0	0	0
54	-	0	0	0	0	0	0	-	0	0	0	0
55	-	0	0	1	0	1	0	-	0	0	0	0
56	-	1	1	0	0	0	0	-	0	0	0	0
57	-	-	-	0	0	0	0	-	0	0	0	0
58	-	-	-	1	0	1	0	-	0	0	1	1
59	-	-	-	0	0	0	0	-	0	0	0	0
60	-	-	-	0	0	0	0	-	0	0	0	0
61	-	-	-	0	1	1	0	-	0	0	0	0
62	-	-	-	0	0	0	0	-	0	0	0	0

Table 15. (cont'd.)

Total length (cm)	Set no. and net depth (m)											
	1 110-119			2 179-190			3 106-113			6 137-146		
	M	F	T	M	F	T	M	F	T	M	F	T
63	-	-	-	0	0	0	0	-	0	0	0	0
64	-	-	-	0	0	0	0	-	0	0	0	0
65	-	-	-	0	0	0	0	-	0	0	0	0
66	-	-	-	0	0	0	0	-	0	0	0	0
67	-	-	-	0	0	0	0	-	0	0	0	0
68	-	-	-	2	0	2	0	-	0	0	0	0
69	-	-	-	0	0	0	0	-	0	0	0	0
70	-	-	-	0	0	0	0	-	0	0	1	1
71	-	-	-	1	0	1	0	-	0	0	-	0
72	-	-	-	1	0	1	0	-	0	0	-	0
73	-	-	-	1	0	1	0	-	0	0	-	0
74	-	-	-	-	0	0	1	-	1	0	-	0
75	-	-	-	-	0	0	-	-	-	0	-	0
76	-	-	-	-	0	0	-	-	-	0	-	0
77	-	-	-	-	0	0	-	-	-	0	-	0
78	-	-	-	-	0	0	-	-	-	1	-	1
79	-	-	-	-	0	0	-	-	-	0	-	0
80	-	-	-	-	0	0	-	-	-	0	-	0
81	-	-	-	-	0	0	-	-	-	0	-	0
82	-	-	-	-	0	0	-	-	-	0	-	0
83	-	-	-	-	0	0	-	-	-	0	-	0
84	-	-	-	-	0	0	-	-	-	0	-	0
85	-	-	-	-	0	0	-	-	-	1	-	1
86	-	-	-	-	0	0	-	-	-	-	-	-
87	-	-	-	-	0	0	-	-	-	-	-	-
88	-	-	-	-	0	0	-	-	-	-	-	-
89	-	-	-	-	0	0	-	-	-	-	-	-
90	-	-	-	-	0	0	-	-	-	-	-	-
91	-	-	-	-	0	0	-	-	-	-	-	-
92	-	-	-	-	0	0	-	-	-	-	-	-
93	-	-	-	-	1	1	-	-	-	-	-	-
94	-	-	-	-	-	-	-	-	-	-	-	-
95	-	-	-	-	-	-	-	-	-	-	-	-

Table 15. (cont'd.)

Total length (cm)	Set no. and net depth (m)											
	1 110-119			2 179-190			3 106-113			6 137-146		
	M	F	T	M	F	T	M	F	T	M	F	T
96	-	-	-	-	-	-	-	-	-	-	-	-
97	-	-	-	-	-	-	-	-	-	-	-	-
98	-	-	-	-	-	-	-	-	-	-	-	-
99	-	-	-	-	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-	-	-	-	-
101	-	-	-	-	-	-	-	-	-	-	-	-
102	-	-	-	-	-	-	-	-	-	-	-	-
103	-	-	-	-	-	-	-	-	-	-	-	-
104	-	-	-	-	-	-	-	-	-	-	-	-
105	-	-	-	-	-	-	-	-	-	-	-	-
106	-	-	-	-	-	-	-	-	-	-	-	-
107	-	-	-	-	-	-	-	-	-	-	-	-
108	-	-	-	-	-	-	-	-	-	-	-	-
109	-	-	-	-	-	-	-	-	-	-	-	-
110	-	-	-	-	-	-	-	-	-	-	-	-
111	-	-	-	-	-	-	-	-	-	-	-	-
112	-	-	-	-	-	-	-	-	-	-	-	-
113	-	-	-	-	-	-	-	-	-	-	-	-
114	-	-	-	-	-	-	-	-	-	-	-	-
115	-	-	-	-	-	-	-	-	-	-	-	-
116	-	-	-	-	-	-	-	-	-	-	-	-
117	-	-	-	-	-	-	-	-	-	-	-	-
Total	100	107	207	24	13	37	6	15	21	11	12	23

Table 15. (cont'd.)

Total length (cm)	Set no. and net depth (m)								
	11 179-187			14 161-179			Total		
	M	F	T	M	F	T	M	F	T
30	-	-	-	-	-	-	-	1	1
31	-	-	-	-	-	-	2	2	4
32	-	-	-	-	-	-	4	5	9
33	-	-	-	-	-	-	11	16	27
34	-	-	-	-	-	-	10	21	31
35	-	-	-	-	-	-	13	10	23
36	-	-	-	-	-	-	22	15	37
37	-	-	-	-	-	-	12	19	31
38	-	-	-	-	-	-	13	14	27
39	-	-	-	-	-	-	6	13	19
40	-	-	-	-	-	-	9	6	15
41	-	-	-	-	-	-	5	4	9
42	-	-	-	-	-	-	2	2	4
43	-	-	-	-	-	-	4	3	7
44	-	-	-	-	-	-	5	3	8
45	-	-	-	-	-	-	2	4	6
46	-	-	-	-	-	-	1	0	1
47	-	-	-	-	-	-	3	0	3
48	-	-	-	-	-	-	0	0	0
49	-	-	-	-	-	-	2	1	3
50	-	-	-	-	-	-	3	1	4
51	-	-	-	-	-	-	1	1	2
52	-	-	-	-	-	-	0	0	0
53	-	-	-	-	-	-	1	1	2
54	-	-	-	-	-	-	0	0	0
55	-	-	-	-	-	-	1	0	1
56	-	-	-	-	-	-	0	1	1
57	-	-	-	-	-	-	0	0	0
58	-	-	-	-	-	-	1	1	2
59	-	-	-	-	-	-	0	0	0
60	-	-	-	-	-	-	0	0	0
61	-	-	-	-	-	-	0	1	1
62	-	-	-	-	-	-	0	0	0

Table 15. (cont'd.)

Total length (cm)	Set no. and net depth (m)								
	11 179-187			14 161-179			Total		
	M	F	T	M	F	T	M	F	T
63	-	-	-	-	-	-	0	0	0
64	-	-	-	-	-	-	0	0	0
65	-	-	-	-	-	-	0	0	0
66	-	-	-	-	-	-	0	0	0
67	-	-	-	-	-	-	0	0	0
68	-	-	-	-	-	-	2	0	2
69	-	-	-	-	-	-	0	0	0
70	-	-	-	-	-	-	0	1	1
71	-	-	-	-	-	-	1	0	1
72	-	-	-	-	-	-	1	0	1
73	-	-	-	-	-	-	1	0	1
74	-	-	-	-	-	-	1	0	1
75	-	-	-	-	-	-	0	0	0
76	-	-	-	-	-	-	0	0	0
77	-	-	-	-	-	-	0	0	0
78	-	-	-	-	-	-	1	0	1
79	-	1	1	-	-	-	0	1	1
80	1	0	1	-	-	-	1	0	1
81	-	0	0	-	-	-	0	0	0
82	-	0	0	-	-	-	0	0	0
83	-	0	0	-	-	-	0	0	0
84	-	0	0	-	-	-	0	0	0
85	-	0	0	-	1	1	1	1	2
86	-	0	0	-	0	0	-	0	0
87	-	0	0	-	0	0	-	0	0
88	-	0	0	-	0	0	-	0	0
89	-	0	0	-	0	0	-	0	0
90	-	0	0	-	0	0	-	0	0
91	-	0	0	-	0	0	-	0	0
92	-	1	1	-	0	0	-	1	1
93	-	0	0	-	1	1	-	2	2
94	-	0	0	-	1	1	-	1	1
95	-	0	0	-	0	0	-	0	0

Table 15. (cont'd.)

Total length (cm)	Set no. and net depth (m) 11 179-187 M	F	T	14 161-179 M	F	T	Total M	F	T
96	-	0	0	-	0	0	-	0	0
97	-	1	1	-	1	1	-	2	2
98	-	0	0	-	0	0	-	0	0
99	-	0	0	-	0	0	-	0	0
100	-	1	1	-	0	0	-	1	1
101	-	2	2	-	3	3	-	5	5
102	-	3	3	-	1	1	-	4	4
103	-	1	1	-	0	0	-	1	1
104	-	3	3	-	3	3	-	6	6
105	-	5	5	-	1	1	-	6	6
106	-	2	2	-	0	0	-	2	2
107	-	3	3	-	0	0	-	3	3
108	-	2	2	-	2	2	-	4	4
109	-	2	2	-	1	1	-	3	3
110	-	2	2	-	3	3	-	5	5
111	-	0	0	-	0	0	-	0	0
112	-	0	0	-	1	1	-	1	1
113	-	1	1	-	-	-	-	1	1
114	-	1	1	-	-	-	-	1	1
115	-	1	1	-	-	-	-	1	1
116	-	0	0	-	-	-	-	0	0
117	-	1	1	-	-	-	-	1	1
Total	1	33	34	0	19	19	142	199	341

Table 16. Length frequency by sex and set of brown cat sharks collected by M/V SUN MAIDEN, March 10-14, 1980.

Total length (cm)	Set no. and net depth (m)									Total		
	4 179-190			13 168-170			16 168					
	M	F	T	M	F	T	M	F	T	M	F	T
44	-	-	-	-	1	1	-	1	1	-	2	2
45	-	-	-	-	0	0	-	1	1	-	1	1
46	-	-	-	-	0	0	-	1	1	-	1	1
47	-	-	-	1	0	1	-	2	2	1	2	3
48	-	-	-	0	3	3	-	0	0	0	3	3
49	-	-	-	0	0	0	1	0	1	1	0	1
50	-	-	-	0	2	2	0	2	2	0	4	4
51	-	-	-	4	-	4	0	-	0	4	-	4
52	-	-	-	1	-	1	2	-	2	3	-	3
53	1	-	1	2	-	2	3	-	3	6	-	6
54	0	-	0	1	-	1	0	-	0	1	-	1
55	1	-	1	2	-	2	0	-	0	3	-	3
56	-	-	-	-	-	-	0	-	0	0	-	0
57	-	-	-	-	-	-	1	-	1	1	-	1
Total	2	0	2	11	6	17	7	7	14	20	13	33

Table 17. Biological data for chinook salmon collected by M/V SUN MAIDEN, March 10-14, 1980.

Set no.	Net depth (m)	Fork length (cm)	Sex	Stomach contents
3	103-113	49	F	<0.5 mL euphausiids
10	80-95	54	F	<0.5 mL euphausiids
10	80-95	58	F	empty
14	161-179	79	F	-
22	225-234	52	Unsexed	-

Table 18. Round weight (g) and mean weight (g) at length for pollock collected by M/V SUN MAIDEN, March 10-14, 1980.

Fork length (cm)	Round weight (g)												Mean weight at length (g)	N
						MALES								
32	263												263	1
33	291												291	1
34	342	373	321	338	332								341	5
35	382	360	378	406	437	395	342	310					376	8
36	388	416	377	412	382	433	388	476	415	401	394	345	398	12
37	458	445	406	448									439	4
38	435	550	506	434	474	452	452						472	7
39	527	521											524	2
40	532	562	503	484	556								527	5
41	539	531	575	603	633	569	590	508					569	8
42	584	614	607	542	549	579	586	451	540				561	9
43	529	678	582	550	647	554	644	686	572				605	9
44	693	609	625	606	591	640	546	651	595				617	9
45	661	703	620										661	3
46	758	899	891										849	3
47	786	905											846	2
						FEMALES								
35	382												382	1
36	466	471	467	405	422	470							450	6
37	480	437	503	419									460	4
38	437												437	1
39	530	471											501	2
40	431												431	1
41	556												556	1
42	752	691											722	2
43	-												-	0
44	687	680	614	651									658	4
45	809	663	777	736	715	896	756						765	7
46	762	779	709	815	720	613	909						758	7
47	734	827	690	852	1169	916	987						882	7
48	938	1016	1133	1133	1129	1028	994						1053	7
49	831	958	844	812	1213	1152	1291						1014	7
50	782	1224	1087	888	999								996	5
51	955	1508	1346	1220									1257	4
52	1483	1229											1356	2
53	1408	1503											1456	2

Appendix Table 1. Bridge log for M/V SUN MAIDEN Cruise, March 10-14, 1980.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 10 SET/HAUL No.: 1

LOCATION: E. Ballenas AREA: Strait of Georgia

START: Lat.: 49° 20.7'N Long.: 124° 04.0'W

END: Lat.: 49° 18.6'N Long.: 124° 00.0'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1130 DURATION: 60 min.

BOTTOM DEPTH m(fm) Start: 399 (218) End: 402 (220) Est. Av. Depth: 400 (219)

HEADROPE NET DEPTH RANGE m(fm): 110-119 (60-65) Est. Av. Depth: 114 (63)

DIRECTION OF SET ° true: 130 SPEED kn: _____ DISTANCE TRAVELLED: 3.4 mi.

SET ON: _____ WATER CONDITION: Choppy TIDE: _____

WIND DIRECTION: S.E. WIND SPEED: 15 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Very light spotting 50-70 fm, light speckling 90-130 fm.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 10 SET/HAUL No.: 2

LOCATION: E. Ballenas AREA: Strait of Georgia

START: Lat.: 49° 18.5'N Long.: 123° 55.2'W

END: Lat.: 49° 18.0'N Long.: 123° 56.9'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1315 DURATION: 30 min.

BOTTOM DEPTH m(fm): Start: 421 (230) End: 411 (225) Est. Av. Depth: 416 (228)

HEADROPE NET DEPTH RANGE m(fm) 190-179 (104-98) Est. Av. Depth: 185 (101)

DIRECTION OF SET ° true: _____ SPEED kn: _____ DISTANCE TRAVELLED: 1.6 mi.

SET ON: _____ WATER CONDITION: Choppy TIDE: _____

WIND DIRECTION: S.E. WIND SPEED: 10-15 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Light speckling 80-90 and 100-120 fm.

Appendix Table 1. (cont'd)

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 10 SET/HAUL No.: 3
LOCATION: W. Halibut Bank AREA: Strait of Georgia
START: Lat.: 49° 20.8'N Long.: 123° 52.8'W
END: Lat.: 49° 19.3'N Long.: 123° 52.0'W
GEAR: Box M.W.T. START TIME: (P.S.T.) :1555 DURATION: 30 min.
BOTTOM DEPTH m(fm) Start: 411 (225) End: 289 (158) Est. Av. Depth: 311 (170)
HEADROPE NET DEPTH RANGE m(fm): 106-113 (58-62) Est. Av. Depth: 110 (60)
DIRECTION OF SET ° true: 150 SPEED kn: _____ DISTANCE TRAVELLED: 1.5 mi.
SET ON: _____ WATER CONDITION: Low swell TIDE: _____
WIND DIRECTION: S.E. WIND SPEED: 10 RECORDER: JMT
TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____
REMARKS: _____
SOUNDER SUMMARY:

Light spotting 55-70 fm; very light speckling 100-120 fm.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 10 SET/HAUL No.: 4
LOCATION: W. Halibut Bank AREA: Strait of Georgia
START: Lat.: 49° 18.6'N Long.: 123° 50.5'W
END: Lat.: 49° 19.5'N Long.: 123° 48.7'W
GEAR: Box M.W.T. START TIME: (P.S.T.) :1655 DURATION: 30 min.
BOTTOM DEPTH m(fm): Start: 329 (180) End: 377 (206) Est. Av. Depth: 366 (200)
HEADROPE NET DEPTH RANGE m(fm): 179-190 (98-104) Est. Av. Depth: 183 (100)
DIRECTION OF SET ° true: 080 SPEED kn: _____ DISTANCE TRAVELLED: 1.6 mi.
SET ON: _____ WATER CONDITION: Choppy TIDE: _____
WIND DIRECTION: W WIND SPEED: 10-15 RECORDER: JMT
TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____
REMARKS: _____
SOUNDER SUMMARY:

Very light spotting; 50-70 fm; very light speckling 90-110 fm.

Appendix Table 1. (cont'd)

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 11 SET/HAUL No.: 5

LOCATION: W. Halibut Bank AREA: Strait of Georgia

START: Lat.: 49° 21.6'N Long.: 123° 47.2'W

END: Lat.: 49° 20.2'N Long.: 123° 47.6'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :0753 DURATION: 30 min.

BOTTOM DEPTH m(fm) Start: 238 (130) End: 357 (195) Est. Av. Depth: 293 (160)

HEADROPE NET DEPTH RANGE m(fm) 176-179 (96-98) Est. Av. Depth: 179 (98)

DIRECTION OF SET ° true: 160 SPEED kn: _____ DISTANCE TRAVELLED: ___ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: N.E. WIND SPEED: 10 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: 7.5-8.0°C (net sounder)

REMARKS: _____

SOUNDER SUMMARY:

Very light spotting 50-100 fm; light-mod. speckling 100-110 fm, light speckling 110-125.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 11 SET/HAUL No.: 6

LOCATION: Halibut Bank AREA: Strait of Georgia

START: Lat.: 49° 20.1'N Long.: 123° 53.3'W

END: Lat.: 49° 20.3'N Long.: 123° 45.4'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :0910 DURATION: 45 min.

BOTTOM DEPTH m(fm):Start: 357 (195) End: 218 (119) Est. Av. Depth: 256 (140)

HEADROPE NET DEPTH RANGE m(fm):137-146 (75-80) Est. Av. Depth: 141 (77)

DIRECTION OF SET ° true: Turned SPEED kn: _____ DISTANCE TRAVELLED: ___ mi.

SET ON: _____ WATER CONDITION: Calm TIDE: _____

WIND DIRECTION: S.E. WIND SPEED: 5 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Moderate speckling 100-120 fm (denser near Bank), very light spotting 75-90, very light spotting 50-65 fm.

Appendix Table 1. (cont'd)

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 11 SET/HAUL No.: 7

LOCATION: S. Halibut Bank AREA: Strait of Georgia

START: Lat.: 49° 16.5'N Long.: 124° 39.9'W

END: Lat.: 49° 17.5'N Long.: 124° 40.0'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1145 DURATION: 30 min.

BOTTOM DEPTH m(fm): Start: 302 (165) End: 227 (124) Est. Av. Depth: 256 (140)

HEADROPE NET DEPTH RANGE m(fm): 179-187 (98-102) Est. Av. Depth: 182 (100)

DIRECTION OF SET ° true: 025 SPEED kn: _____ DISTANCE TRAVELLED: ___ mi.

SET ON: _____ WATER CONDITION: Calm TIDE: _____

WIND DIRECTION: ____ WIND SPEED: __ RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Very light spotting 40-70 fm, light-moderate speckling 108-138 fm in two bands peaking at 100 and 124 fm.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 11 SET/HAUL No.: 8

LOCATION: S. Halibut Bank AREA: Strait of Georgia

START: Lat.: 49° 15.2'N Long.: 123° 41.2'W

END: Lat.: 49° 15.4'N Long.: 123° 38.8'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1315 DURATION: 30 min.

BOTTOM DEPTH m(fm): Start: 357 (195) End: 366 (200) Est. Av. Depth: 364 (199))

HEADROPE NET DEPTH RANGE m(fm): 223-227 (122-124) Est. Av. Depth: 225 (123)

DIRECTION OF SET ° true: _____ SPEED kn: _____ DISTANCE TRAVELLED: 1.8 mi.

SET ON: _____ WATER CONDITION: Calm TIDE: _____

WIND DIRECTION: ____ WIND SPEED: 0 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Very light spotting 40-65 fm; light-moderate speckling 96-136 fm with denser peaks at 98 and 130 fm.

Appendix Table 1. (cont'd)

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 11 SET/HAUL No.: 9
LOCATION: S. Halibut Bank AREA: Strait of Georgia
START: Lat.: 49° 16.2'N Long.: 123° 40.7'W
END: Lat.: 49° 16.4'N Long.: 123° 38.7'W
GEAR: Box M.W.T. START TIME: (P.S.T.) :1630 DURATION: 30 min.
BOTTOM DEPTH m(fm): Start: 293 (160) End: 293 (160) Est. Av. Depth: 293 (160)
HEADROPE NET DEPTH RANGE m(fm): 183-185 (100-101) Est. Av. Depth: 183 (100)
DIRECTION OF SET ° true: ___ SPEED kn: _____ DISTANCE TRAVELLED: ___ mi.
SET ON: _____ WATER CONDITION: _____ TIDE: _____
WIND DIRECTION: ____ WIND SPEED: ___ RECORDER: JMT
TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____
REMARKS: _____
SOUNDER SUMMARY:

Very light spotting 40-100 fm, light-moderate speckling 100-150 fm.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 12 SET/HAUL No.: 10
LOCATION: S. Halibut Bank AREA: Strait of Georgia
START: Lat.: 49° 14.4'N Long.: 123° 40.4'W
END: Lat.: 49° 14.6' Long.: 123° 36.5'W
GEAR: Box M.W.T. START TIME: (P.S.T.) :0745 DURATION: 30 min.
BOTTOM DEPTH m(fm): Start: 421 (230) End: 362 (198) Est. Av. Depth: 375 (205)
HEADROPE NET DEPTH RANGE m(fm): 95-80 (52-44) Est. Av. Depth: 88 (48)
DIRECTION OF SET ° true: _____ SPEED kn: _____ DISTANCE TRAVELLED: 2.3 mi.
SET ON: _____ WATER CONDITION: _____ TIDE: _____
WIND DIRECTION: S.E. WIND SPEED: 10 RECORDER: JMT
TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____
REMARKS: _____
SOUNDER SUMMARY:

Very light spotting 40-60 fm, moderate speckling 80-125 fm (later 90-145).

Appendix Table 1. (cont'd)

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 12 SET/HAUL No.: 11
LOCATION: S.E. Halibut Bank AREA: Strait of Georgia
START: Lat.: 49° 16.4'N Long.: 123° 29.0'W
END: Lat.: 49° 15.2'N Long.: 123° 30.4'W
GEAR: Box M.W.T. START TIME: (P.S.T.) :1052 DURATION: 30 min.
BOTTOM DEPTH m(fm):Start: 357 (195) End: 527 (288) Est. Av. Depth: ( )
HEADROPE NET DEPTH RANGE m(fm): 179-187 (98-102) Est. Av. Depth: 182 (100)
DIRECTION OF SET ° true: 220 SPEED kn: _____ DISTANCE TRAVELLED: mi.
SET ON: _____ WATER CONDITION: _____ TIDE: _____
WIND DIRECTION: ____ WIND SPEED: ___ RECORDER: JMT
TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____
REMARKS: _____
SOUNDER SUMMARY:

Very light spotting 40-70 fm, moderate speckling 85-110 fm.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 12 SET/HAUL No.: 12
LOCATION: S.E. Halibut Bank AREA: Strait of Georgia
START: Lat.: 49° 17.2'N Long.: 123° 33.8'W
END: Lat.: 49° 17.3'N Long.: 123° 31.5'W
GEAR: Box M.W.T. START TIME: (P.S.T.) :1240 DURATION: 25 min.
BOTTOM DEPTH m(fm):Start: 327 (179) End: 238 (130) Est. Av. Depth: 293 (160)
HEADROPE NET DEPTH RANGE m(fm): 223-225 (122-123) Est. Av. Depth: 223 (122)
DIRECTION OF SET ° true: 090 SPEED kn: _____ DISTANCE TRAVELLED: mi.
SET ON: _____ WATER CONDITION: B-3 TIDE: _____
WIND DIRECTION: S.E. WIND SPEED: 15 RECORDER: JMT
TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____
REMARKS: _____
SOUNDER SUMMARY:

Moderate speckling 85-120 fm, very light spotting 40-85.

Appendix Table 1. (cont'd)

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 12 SET/HAUL No.: 13

LOCATION: Point Grey AREA: Strait of Georgia

START: Lat.: 49° 17.2'N Long.: 123° 21.2'W

END: Lat.: 49° 17.8'N Long.: 123° 23.1'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1525 DURATION: 30 min.

BOTTOM DEPTH m(fm): Start: 201 (110) End: 256 (140) Est. Av. Depth: 238 (130)

HEADROPE NET DEPTH RANGE m(fm): 168-170 (92-93) Est. Av. Depth: 170 (93)

DIRECTION OF SET ° true: 290 SPEED kn: _____ DISTANCE TRAVELLED: 1.4 mi.

SET ON: _____ WATER CONDITION: B-3 TIDE: _____

WIND DIRECTION: S.E. WIND SPEED: 15-20 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Light speckling 88-110 fm, densest 88-93.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 13 SET/HAUL No.: 14

LOCATION: Sand Heads AREA: Strait of Georgia

START: Lat.: 49° 12.8'N Long.: 123° 22.4'W

END: Lat.: 49° 12.6'N Long.: 123° 25.5'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :0820 DURATION: 30 min.

BOTTOM DEPTH m(fm): Start: 271 (148) End: 304 (166) Est. Av. Depth: 283 (155)

HEADROPE NET DEPTH RANGE m(fm): 179-161 (98-88) Est. Av. Depth: 165 (90)

DIRECTION OF SET ° true: _____ SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Choppy TIDE: _____

WIND DIRECTION: S.W. WIND SPEED: 10-15 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: 6.0°C(net sounder)

REMARKS: _____

SOUNDER SUMMARY:

Light spotting 40-60 fm, moderate speckling 90-120 but densest 90-98.

Appendix Table 1. (cont'd)

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 13 SET/HAUL No.: 15

LOCATION: Thrasher Rock AREA: Strait of Georgia

START: Lat.: 49° 07.7'N Long.: 123° 32.6'W

END: Lat.: 49° 08.2'N Long.: 123° 30.4'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1052 DURATION: 30 min.

BOTTOM DEPTH m(fm): Start: 421 (230) End _____ Est. Av. Depth: _____

HEADROPE NET DEPTH RANGE m(fm): 220-229 (120-125) Est. Av. Depth: _____

DIRECTION OF SET ° true: ___ SPEED kn: _____ DISTANCE TRAVELLED: ___ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: S.W. WIND SPEED: 5-10 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Moderate speckling 80-110 fm. Set below the layer which showed on the sounder. Some targets entered net while it passed through 80-110 fm.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 13 SET/HAUL No.: 16

LOCATION: Thrasher Rock AREA: Strait of Georgia

START: Lat.: 49° 08.7'N Long.: 123° 31.2'W

END: Lat.: 49° 08.3'N Long.: 123° 32.4'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1157 DURATION: 15 min.

BOTTOM DEPTH m(fm): Start: 355 (194) End: 347 (190) Est. Av. Depth: 351 (192)

HEADROPE NET DEPTH RANGE m(fm): 168 (92) Est. Av. Depth: 168 (92)

DIRECTION OF SET ° true: _____ SPEED kn: _____ DISTANCE TRAVELLED: ___ mi.

SET ON: _____ WATER CONDITION: _____ TIDE: _____

WIND DIRECTION: S.W. WIND SPEED: 5-10 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Moderate speckling 80-110 fm, very light spotting above. Fished in the layer of speckling.

Appendix Table 1. (cont'd)

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 13 SET/HAUL No.: 17

LOCATION: Sand Heads AREA: Strait of Georgia

START: Lat.: 49° 06.8'N Long.: 123° 28.4'W

END: Lat.: 49° 08.2'N Long.: 123° 28.8'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1435 DURATION: 15 min.

BOTTOM DEPTH m(fm): Start: 329 (180) End: 329 (180) Est. Av. Depth: 329 (180)

HEADROPE NET DEPTH RANGE m(fm): 161-163 (88-89) Est. Av. Depth: 161 (88)

DIRECTION OF SET ° true: ___ SPEED kn: _____ DISTANCE TRAVELLED: ___ mi.

SET ON: _____ WATER CONDITION: _____ TIDE: _____

WIND DIRECTION: ____ WIND SPEED: ___ RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Moderate-heavy speckling 80-130 fm. Fished top of layer.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 13 SET/HAUL No.: 18

LOCATION: Apex AREA: Strait of Georgia

START: Lat.: 49° 01.5'N Long.: 123° 23.1'W

END: Lat.: 49° 01.8'N Long.: 123° 19.9'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1715 DURATION: 20 min.

BOTTOM DEPTH m(fm): Start: 241 (132) End: 227 (124) Est. Av. Depth: 219 (120)

HEADROPE NET DEPTH RANGE m(fm): 170-174 (93-95) Est. Av. Depth: 172 (94)

DIRECTION OF SET ° true: _____ SPEED kn: _____ DISTANCE TRAVELLED: ___ mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: S.W. WIND SPEED: 5-10 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Moderate speckling 80-120. Fished in lower half.

Appendix Table 1. (cont'd)

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 14 SET/HAUL No.: 19

LOCATION: Apex AREA: Strait of Georgia

START: Lat.: 48° 59.5'N Long.: 123° 25.9'W

END: Lat.: 49° 00.3'N Long.: 123° 23.0'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :0820 DURATION: 30 min.

BOTTOM DEPTH m(fm):Start: 278 (152) End: 238 (130) Est. Av. Depth: 256 (140)

HEADROPE NET DEPTH RANGE m(fm): 164-172 (90-94) Est. Av. Depth: 170 (93)

DIRECTION OF SET ° true: ___ SPEED kn: _____ DISTANCE TRAVELLED: ___ mi.

SET ON: _____ WATER CONDITION: Choppy TIDE: _____

WIND DIRECTION: S.E. WIND SPEED: 15-20 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Light-moderate speckling 80-100 fm, densest 83-90.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 14 SET/HAUL No.: 20

LOCATION: E. Mayne I AREA: Strait of Georgia

START: Lat.: 49° 52.8'N Long.: 123° 12.3'W

END: Lat.: 49° 51.8'N Long.: 123° 10.5'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1105 DURATION: 30 min.

BOTTOM DEPTH m(fm):Start: 143 (78) End: 137 (75) Est. Av. Depth: 139 (76)

HEADROPE NET DEPTH RANGE m(fm):121-126 (66-69) Est. Av. Depth: 123 (67)

DIRECTION OF SET ° true: 130 SPEED kn: _____ DISTANCE TRAVELLED: 1.6 mi.

SET ON: _____ WATER CONDITION: Choppy TIDE: _____

WIND DIRECTION: W WIND SPEED: 15 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Moderate-heavy spotting 66 fm to bottom last half of two; moderate spotting 60 fm to bottom first half. Light spotting 30-45 fm.

Appendix Table 1. (cont'd)

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 14 SET/HAUL No.: 21

LOCATION: E Mayne I AREA: Strait of Georgia

START: Lat.: 49° 53.0'N Long.: 123° 13.4'W

END: Lat.: 49° 56.0'N Long.: 123° 14.3'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1225 DURATION: 60 min.

BOTTOM DEPTH m(fm): Start: 146 (80) End: 152 (83) Est. Av. Depth: 146 (80)

HEADROPE NET DEPTH RANGE m(fm): 69-79 (38-43) Est. Av. Depth: 77 (42)

DIRECTION OF SET ° true: ___ SPEED kn: _____ DISTANCE TRAVELLED: 3.2 mi.

SET ON: _____ WATER CONDITION: Light chop TIDE: _____

WIND DIRECTION: S.W. WIND SPEED: 10 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Light spotting 30-50 fm, and 60 fm to bottom.

VESSEL: SUN MAIDEN DATE: Yr 80 Mo 03 Day 14 SET/HAUL No.: 22

LOCATION: Sand Heads AREA: Strait of Georgia

START: Lat.: 49° 06.7'N Long.: 123° 27.6'W

END: Lat.: 49° 08.9'N Long.: 123° 26.5'W

GEAR: Box M.W.T. START TIME: (P.S.T.) :1530 DURATION: 25 min.

BOTTOM DEPTH m(fm): Start: 293 (160) End: 300 (164) Est. Av. Depth: 298 (163)

HEADROPE NET DEPTH RANGE m(fm): 225-234 (123-128) Est. Av. Depth: 229 (125)

DIRECTION OF SET ° true: _____ SPEED kn: _____ DISTANCE TRAVELLED: ___ mi.

SET ON: _____ WATER CONDITION: _____ TIDE: _____

WIND DIRECTION: S.W. WIND SPEED: 15 RECORDER: JMT

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY:

Moderate-heavy speckling 85-140 fm. Fished the bottom of this layer.

Appendix Table 2. List of species collected on M/V SUN MAIDEN, March 10-14, 1980.

Scientific name	Common name
Agnatha	Lamprey
Apristurus brunneus	Brown cat shark
Squalus acanthias	Spiny dogfish
Hydrolagus colliei	Ratfish
Clupea harengus pallasi	Pacific herring
Oncorhynchus tshawytscha	Chinook salmon
Thaleichthys pacificus	Eulachon
Leuroglossus stilbius schmidti	Northern smoothtongue
Myctophidae	Lanternfish
Gadus macrocephalus	Pacific cod
Merluccius productus	Pacific hake
Theragra chalcogramma	Walleye pollock
Liparis sp.	Snailfish
Atheresthes stomias	Arrowtooth flounder
Hippoglossoides elassodon	Flathead sole
Microstomas pacificus	Dover sole
Parophrys vetulus	English sole
Decapoda	Shrimp, Glass shrimp
Cephalopoda	Squid

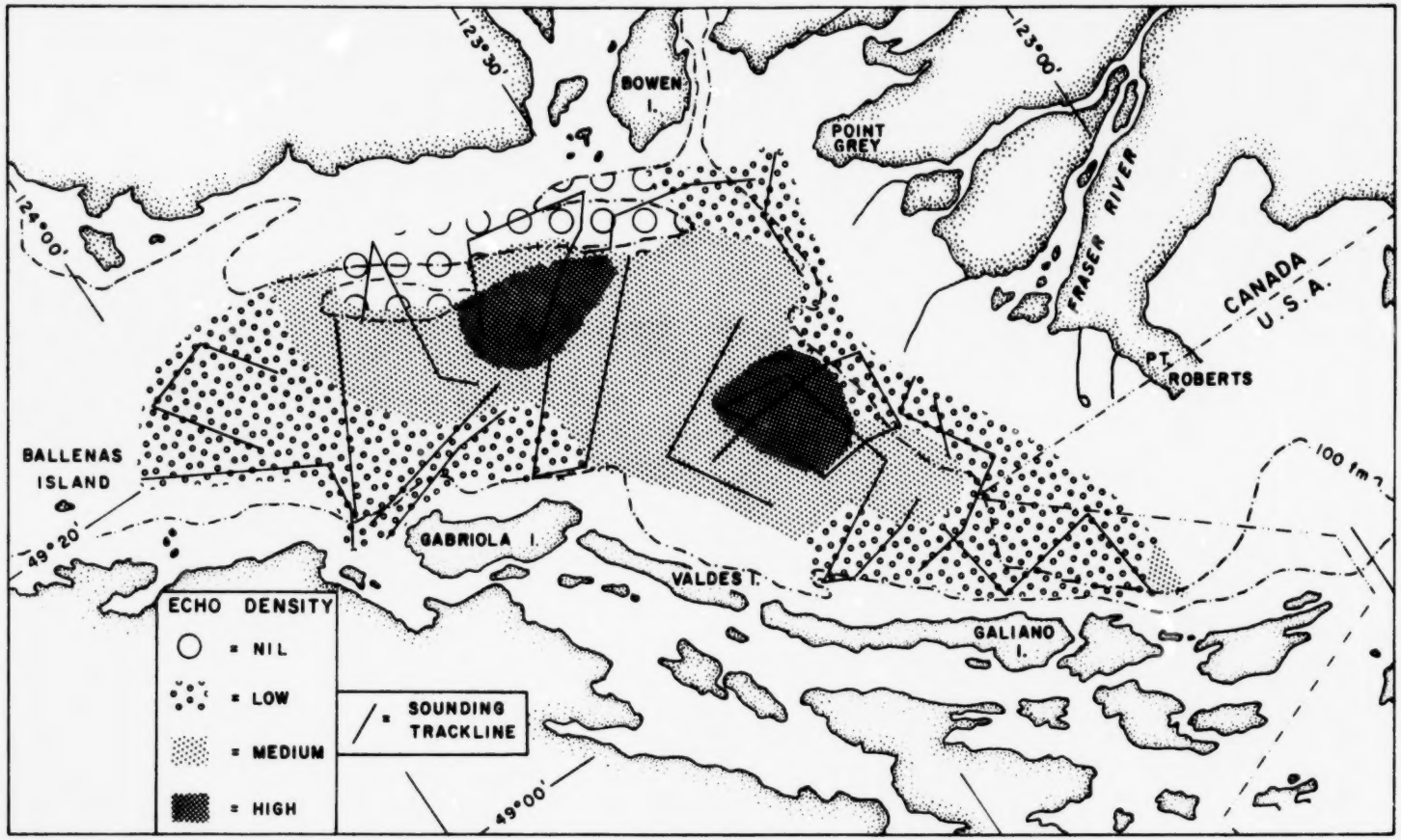

Fig. 1. Location of sounding tracklines and relative densities of midwater targets during M/V SUN MAIDEN cruise, March 10-14, 1980.

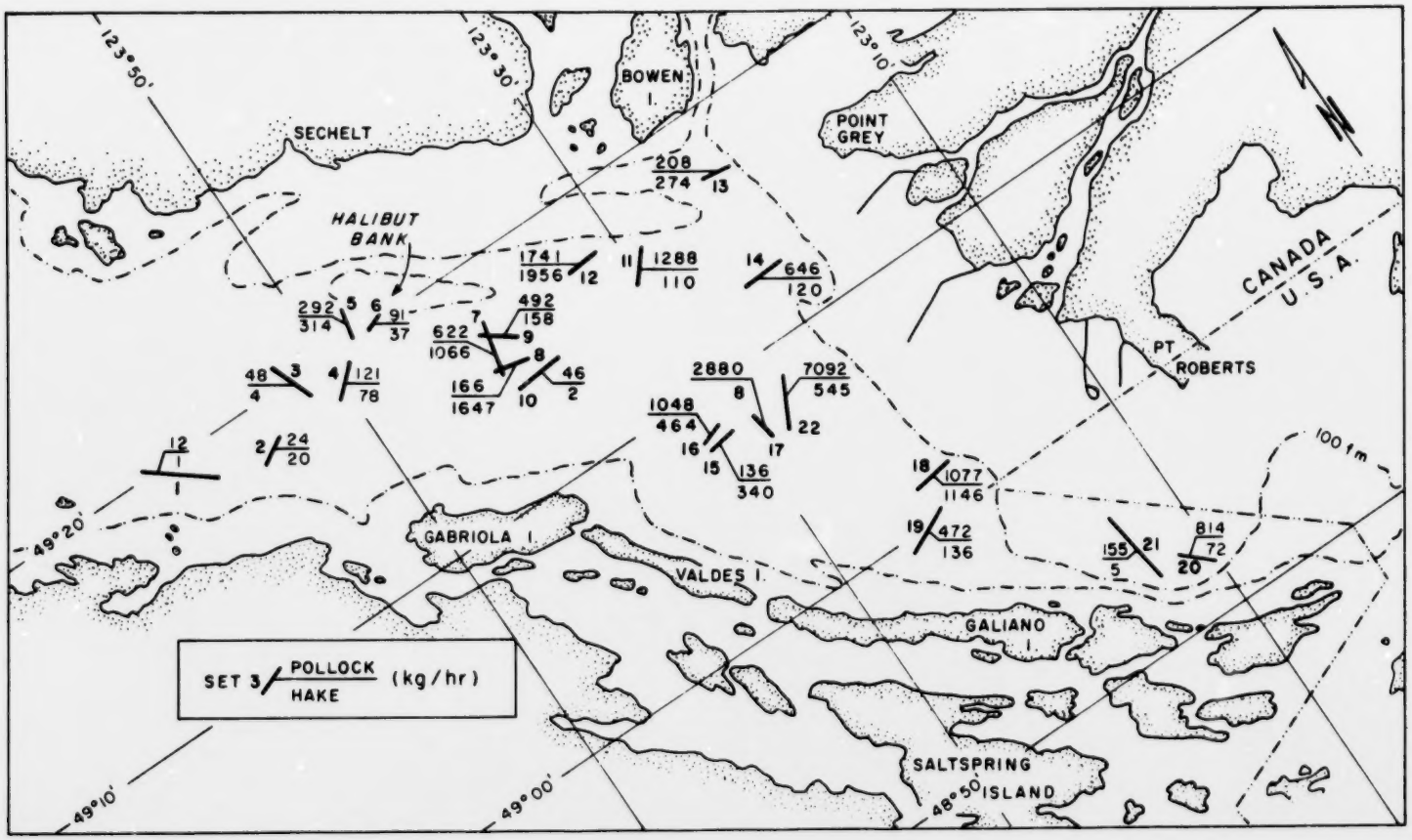

Fig. 2. Location of sets and catch rates for pollock and hake during M/V SUN MAIDEN cruise, March 10-14, 1980.

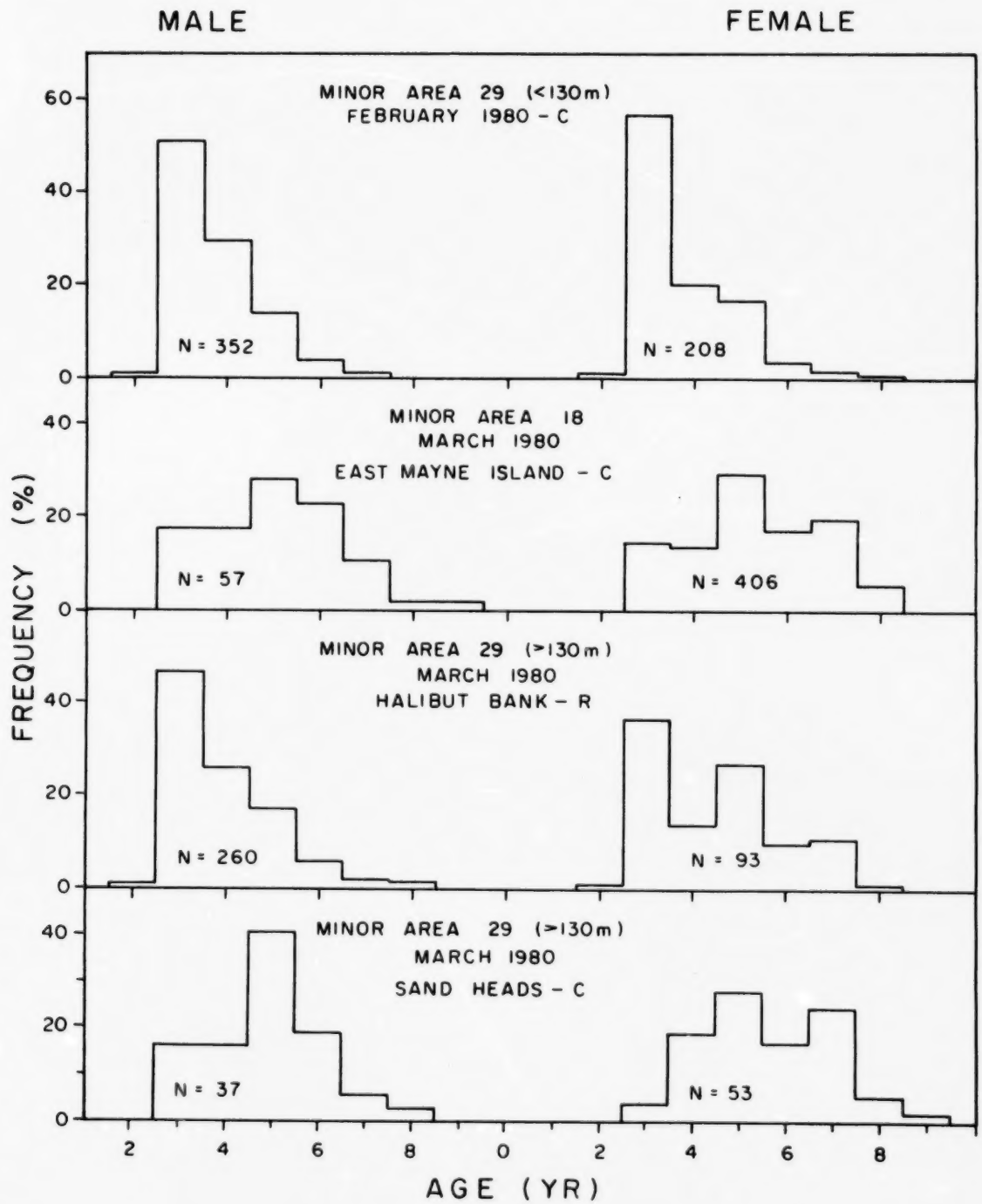

Fig. 3. Age-frequency for pollock caught commercially (C) and during M/V SUN MAIDEN research cruise (R: sets 7, 9, 12).